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Archives of Dermatology and Syphilology

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TINEA BARBAE INVOLVING THE UPPER LIP AND ACCOMPANIED BY DERMATOPHYTID *

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The following case,[1] reported in brief, may serve as a peg on which to hang a discussion of some of the problems of ringworm infection.

G. K., white, aged 44, a chauffeur, was admitted to the New York Skin and Cancer Hospital on Dec. 5, 1928. His daughter had been under treatment about three weeks previously for ringworm involving the region of the knee. The eruption on the patient's face was said to be of two or three weeks' duration. On admission, the whole left side of the face was greatly swollen and red and dotted with crusts and pustules; the inflammation had spread well across the neck onto the right side, and involved also the entire left side and middle of the upper lip. The hairs were loose and easily removed. The nodes on the left side of the neck were swollen and tender; movement of the neck was difficult and painful. Prostration was considerable; the man was evidently sick. On account of the involvement of the upper lip, a provisional diagnosis of severe coccogenic sycosis was made, but examination of crusts and scales from the left side of the face over the mandible and from the left upper lip revealed mycelia in large amount. The diagnosis was therefore changed to tinea barbae. Cultures on Sabouraud's medium made this day and also later produced a luxuriant growth of a spore-bearing organism, which was probably a contamination. No ringworm organism was ever obtained by culture. His temperature on December 7 was 101 F., falling to normal by December 10, and remaining normal during the rest of his stay in the hospital, except for a rise to 99.6 F. on December 27, which coincided with a fresh outbreak on the right side of the upper lip beyond the region first affected.

On the patient's admission to the hospital treatment was begun with starch poultices, followed by wet dressings of solution of aluminum acetate and then of boric acid solution. He received irradiation with ½ unit of x-rays on each side of the face on December 10 and 14. On December 7, he received locally an ointment containing 3 per cent of sulphonated bitumen, N.F., and 5 per cent of white precipitate. On December 12, 14, 17 and 19, he received each day 1 Gm. of sodium thiosulphate intravenously. During this time there was no perceptible change in his condition. Beginning on December 20 and continuing to Jan. 20, 1929, he received dilute compound solution of iodine intravenously every two to four days as recommended by Ravaut.[2] Improvement began almost immediately after beginning this treatment. The fresh outbreak and the second rise of temperature occurred on December 27, the day on which he received the fourth injection of the solution of iodine, and on this day mycelia were recovered from

* Submitted for publication, June 24, 1930.

1. Williams, C. M.: Tinea Barbae Involving the Upper Lip, Arch. Dermat. & Syph. **19**:1020 (June) 1929; ibid. **20**:403 (Sept.) 1929; in discussion on Jadassohn: Morphology of Skin Lesions, ibid. **21**:369 (March) 1930.

2. Ravaut, Duval and Rabeau: Ann. de dermat. et syph. **8**:326, 1927.

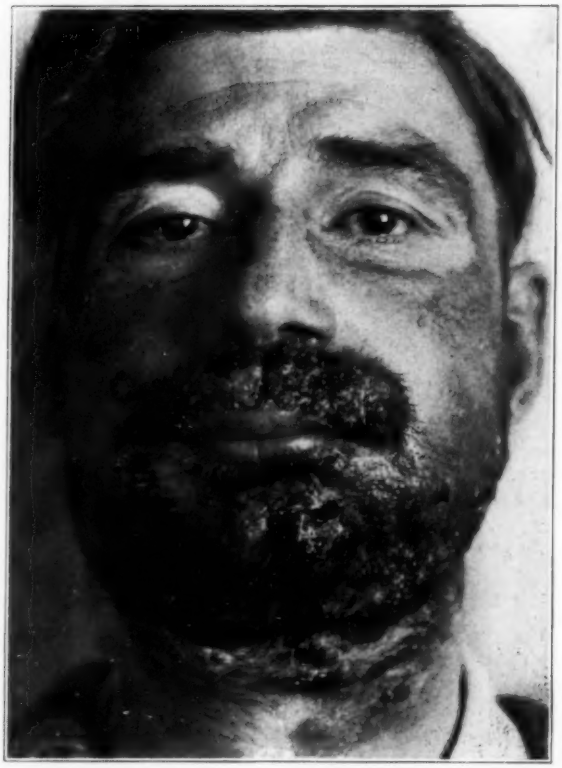

Fig. 1.—Patient with tinea barbae, Dec. 10, 1928. Note the extensive involvement, including the upper lip, and the great swelling.

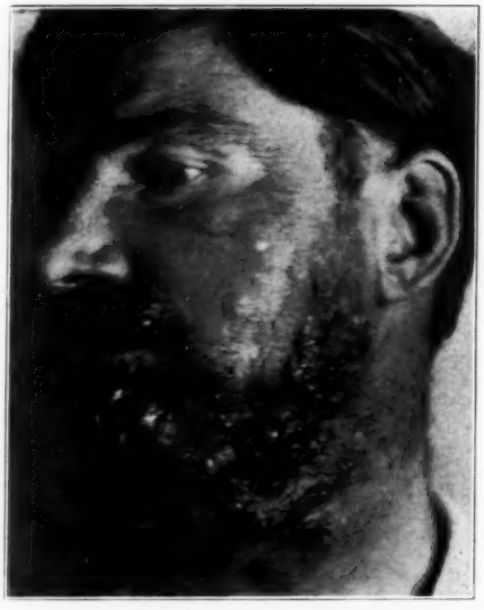

Fig. 2.—Same as figure 1; lateral view.

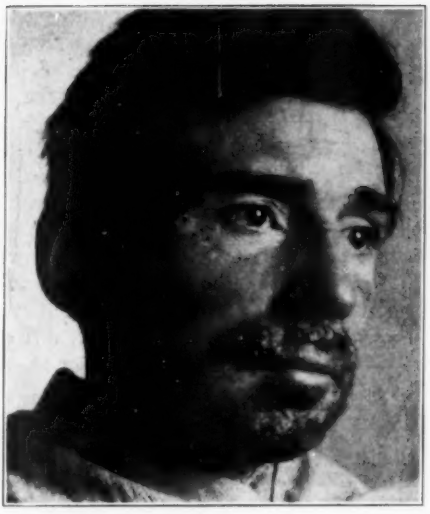

Fig. 3.—Note the extension of the disease to the right upper lip on Dec. 28, 1928.

Fig. 4.—March 27, 1930; compare with figure 2. Note the scarring.

the scales and crusts of this new eruption. The results of other microscopic examinations and the cultures were persistently negative. Three days later, there was an outbreak of typical lichenoid dermatophytid on the whole trunk, which lasted a few days only. Improvement continued, and the patient was discharged cured on January 30.

On March 22, 1930, he reported at my office for examination. There had been no recurrence of the condition on the face, which was smooth, but which showed scars on the left side, the upper lip and the neck, where the eruption had been most severe. Examination of the feet showed the right great toe-nail greatly thickened and horny and raised from its bed, except for a triangular area at the base. The upper part of the nail was tough and opaque, while the lower layers were soft, moist and brownish. The patient stated that this condition of the nail had been present since childhood. The second toe-nail was thick and horny, but not so much so as the first. The third and fourth nails were apparently normal.

Fig. 5.—Mild type of mycotic intertrigo, March 27, 1930. From a similar lesion on the right foot, mycelia were recovered.

The fifth nail was soft and opaque, with fine longitudinal striae, and was fringed at the free border. There was slight maceration in the fourth interspace, and a tiny crack at the bottom, these changes being inconspicuous and apparently unimportant. The toes of the left foot showed practically the same changes as those of the right. No other lesions were noted on the feet. Examination of scrapings from the fourth right interspace showed a fragment of segmenting mycelium; clippings from the first right toe-nail, after soaking in potash, showed many segmenting mycelia, apparently of the same type as that found in the fourth interspace. Clippings from the fifth right toe-nail showed no mycelia, although the nail had the same clinical appearance as many others in which I have found mycelia in large amount. Cultures were made from clippings of the right toe-nail, and produced in nearly every instance green colonies of a spore-bearing organism, apparently the same as that grown from the face the year before, but this identity is not established. Cultures from the fourth interspace were negative. A trichophytin patch test on the right forearm was mildly positive.

COMMENT

Location.—The involvement of the upper lip in cases of tinea barbae is so unusual as to be a medical curiosity—so unusual, in fact, that the diagnosis cannot be accepted unless confirmed by the microscope or by culture. The differentiation between coccogenic and trichophytic sycosis could not be made until Gruby, in 1842, established the true nature of the latter. Gruby, in his report, spoke of sycosis as involving the upper lip; he may have chanced on a case like the one here recorded, or he may simply have quoted the classic description of the disease, unaware —how could it be otherwise?—that two eruptions so similar in appearance could be caused by such widely different organisms. His contemporaries, as was to be expected, failed to find his organism in sycosis of the upper lip, and it required years of patient effort to discover the differences that distinguish the clinical appearance and the course of the two diseases. We are now enlarging our conception of dermatophytosis to an extent impossible to conceive of a few years ago, but if this work is to have a sure foundation, it must rest on a careful clinical description of each case in conjunction with painstaking work in the laboratory. The report of series of cases in which the diagnosis is not confirmed by the laboratory and the report of laboratory observations without a careful clinical description of the individual case under discussion can only lead to confusion in the future, as it already has done in the past.

Local Inflammatory Reaction.—This symptom is common in ringworm of the beard, and not unusual elsewhere, and resembles that caused by the ordinary pus-producing organisms. It may go on to the production of small amounts of pus, but only in the most exceptional cases [3] is there any abscess formation. Even on the scalp, where pus may exude from a multitude of small openings, incision, which should never be practiced, opens up boggy cellular tissue, but reveals no abscess cavity. Suppuration seems to be produced by the fungus itself and not by any superadded infection. It is rare on other parts of the body than the scalp and bearded face, but I have seen it on the hypogastric and iliac regions. On the hands and feet there may be great swelling, causing complete disability and giving the appearance of cellulitis, with many superficial pustules, but I have never seen subcutaneous pus in these regions, probably because of the absence of hair. The recognition of deep inflammatory reaction as a possible symptom of ringworm is most important, as many of these cases are mistaken for infection with the ordinary pus-producing organisms, resulting in misdirected treatment.

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3. Pelévine and Tchernogouboff: Ann. de dermat. et syph. **8**:403, 1927.

General Symptoms.—This case presented the common symptoms of any generalized infection—fever, prostration and anorexia. These symptoms are infrequent in ringworm infection, but they are probably more common than is generally supposed, and may occur in any case in which the infection strikes deep, particularly on the scalp and beard, where the fungus grows along the hair shaft to the bottom of the follicle and spreads thence into the subcutaneous tissue. The adjacent lymph nodes in the case reported were enlarged, painful and tender, as frequently occurs when the scalp or face is deeply infected; in similar cases, the fungus has been recovered from the circulating blood and from the swollen nodes. This swelling of the nodes may occur also in cases of infection of the hands and feet, and in one case involving the foot, the fungus was recovered from an inguinal node.[4] This case illustrates the occurrence of a variety of constitutional symptoms in ringworm and also their transitory character. Although the organism may invade the blood and lymph nodes, it is generally unable to maintain itself there, but dies out from all tissues except the epidermal. We have no satisfactory explanation of the occurrence of deep infection and general symptoms in some cases and not in others; it is probably dependent on variation in the virulence of the parasite, both as between species and within a single species.

Allergic Phenomena.—It is noteworthy that ringworm parasites could be found on the face on only two occasions, in spite of repeated and painstaking examinations—on the first day of admission to the hospital and at the beginning of a recrudescence. This disappearance of the fungus at the height of a severe infection is the rule in kerion, in which it is explained as due to heightened resistance of the tissue, the result of stimulation by the products of parasitic growth. In kerion the disappearance of the parasite is followed, as one might expect, by spontaneous disappearance of the lesions. In the case under discussion, the lesions did not disappear, although parasites were no longer found. It is probable, therefore, that the tissue had acquired the power to destroy most of the parasites, making the discovery of those remaining difficult, and that the skin had also acquired the power to respond by a severe reaction to a very small amount of parasitic material. An analogous condition is seen in syphilis; spirochetes are found in very small numbers in tertiary syphilitic nodules and gummas, while the tissue reaction is much more severe than that which occurs in the secondary period, when the parasites exist in much larger numbers. In the case under discussion, when the parasite was discovered for the second time it was in a fresh spot; the disease had extended to the right side of the upper lip, which had been but slightly involved at first. This

4. White, C.: Mycotic Inguinal Lymphadenitis Associated with Superficial Fungus Dermatitis of the Feet, Arch. Dermat. & Syph. **18**:271 (Aug.) 1928.

exacerbation occurred seventeen days after the first roentgen exposure and five days after the first injection of compound solution of iodine. It is usual for a roentgen exposure in tinea barbae to cause a rather strong inflammatory reaction in the whole affected area, but this usually occurs within a few days; in the present instance the interval was seventeen days, and there was no general reaction—only a local extension. However, the exacerbation may have been dependent in some way on either the roentgen exposure or the injection of compound solution of iodine, but in what way I do not know. The secondary eruption appeared three days after the extension of the disease and twenty days after the roentgen exposure—it may well have been dependent on the latter, although dermatophytid may occur in cases of kerion in which roentgen treatment has never been given. It was first described by Jadassohn in connection with kerion, then was observed as a complication of tinea barbae, as in this case, and finally was observed in connection with tinea of the feet. Instead of assuming this insignificant lichenoid form, the eruption may be erythematous, eczematous or vesicular, or it may resemble erythema multiforme, erythema nodosum or pityriasis rosea—in fact, it may resemble the rash produced by almost any acute toxemia, whether it is bacterial or of some other type. I have seen an eruption of this type so acute that my first diagnosis was acute ivy poisoning of the hands. No matter what the type, this secondary rash is temporary, disappearing in a few weeks at the most, without treatment. No search for the parasite was made in the secondary eruption in this case. In other cases reported in the literature and in those observed by me, the search for a parasite in these secondary lesions is usually unsuccessful, but sometimes, if the search is made at the beginning of the secondary eruption, parasites may be found, even though later examinations reveal none. This secondary eruption is due to the sensitization of the skin by organisms or their toxins circulating in the blood, and the subsequent irritation of this sensitized skin by more organisms or toxins. The sensitized skin has acquired the property of responding in this way, that is, by the production of a transitory eruption. It has also acquired the property of destroying in a short time the parasites that are brought to it. It is well to bear in mind these two phenomena, the power to respond by a secondary eruption and the power to destroy the invading parasite. Both may be called allergic, that is, abnormal reactions, but they are not necessarily dependent on the same factors. If the power to destroy parasites is strong, the eruption will be transitory. If this protective power is not sufficiently strong, some of the parasites may escape, and, acting on a sensitized skin, may produce persistent lesions, severe and extensive out of all proportion to the number of parasites remaining. It may be that this accounts for some of the dyshidrotic eruptions on the palms and soles which persist

or recur long after the primary infection, and in which it may be difficult or impossible to demonstrate any parasite.

Treatment.—As kerion of the scalp is usually self-limited, going on to complete recovery in a few days or weeks under the use of simple fomentations, it might be expected that a deep and severe case of tinea barbae would run the same course. This is notoriously not the fact. Severe tinea barbae is usually, as in this case, exceedingly rebellious to treatment. We have no explanation of this difference in the course of the two infections, otherwise similar. It was this rebelliousness that led Ravaut to the use of compound solution of iodine, which proved so successful in this case. The method as first used had the great disadvantage of obliterating the vein after a few injections. This has been avoided by Ravaut's [5] newer technic, in which he dilutes the solution of iodine with a solution of sodium thiosulphate. At the present time I am using, with apparently good results, a solution made up as follows: iodine, 1 Gm.; sodium iodide, 10 Gm.; water, 100 Gm.

From 0.5 to 1 cc. of this solution is drawn into a sterile syringe; 10 cc. of a 20 per cent solution of sodium thiosulphate is drawn into the same syringe, and the mixture is then injected into the vein.

Follow-Up.—The trichophytin patch test was mildly positive about fifteen months after a well developed trichophytid eruption.

The great toe-nails were thickened and deformed, and if allowed to grow, they would undoubtedly have presented the appearance known as onychogryphosis. This is, I believe, a hereditary deformity, and has nothing to do with tinea, yet in at least two cases I have found ringworm organisms in such nails. In each case the nail was soft on the lower surface. I believe that this localization of ringworm organisms is purely accidental, and that they have nothing to do with the overgrowth of nail tissue—they find a favorable site in the warm, moist, horny tissue. But the organism was there, and it was found also in the fourth interspace. Had it been living there as an apparently harmless saprophyte for many years, and had it then, for some undiscovered reason, invaded the face? Or had the face been infected first, and the infection then carried to the feet? Or were the two ringworm infections, that on the face and that on the feet, entirely independent of each other, and perhaps caused by different species? I cannot tell. What is certain is that the patient is now a "carrier," a potential spreader of the disease.

Examples of dermatophytid may be rare, but they are not nearly so rare as published statistics would indicate. The number of cases observed will increase as dermatologists learn to look for the dermatophytid as a complication of that most frequent of all dermatoses—tinea.

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5. Ravaut: Ann. de dermat. et syph. **10**:739 (July) 1929.

DERMATITIS DUE TO SENSITIZATION TO CONTACT SUBSTANCES

DERMATITIS VENENATA, OCCUPATIONAL DERMATITIS *

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AND
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In spite of much confusion in terminology, most students of dermatology have a fairly definite concept of the type of dermatitis usually referred to in English speaking countries as dermatitis venenata and on the Continent as dermatitis eczematosa artefacta. It includes the eruptions due to plants, antiseptics and cosmetics and most of the occupational dermatoses. They are characterized by their transient character, by their origin at, and usual limitation to, the region where the exciting agent is applied, and as a consequence their frequent occurrence on the hands and face, by their disappearance soon after complete protection from this exciting agent and by the usual absence of residual changes in the skin.

In appearance (and histology) the eruptions vary from that of a severe rhus dermatitis with coalesced vesicles, intense edema and hardly perceptible infiltration, to that of a photographer's dermatitis with marked infiltration, hyperkeratosis and fissuring, and little evidence of vesiculation. A complete scale of intermediate gradations between these extreme types can, however, be observed, and the clinical and histologic differences seem explained by the acuteness or chronicity of the process, especially by whether a single transient exposure or whether prolonged or repeated contact is necessary to produce the lesions. On the other hand, as has so often been pointed out, the picture of any of these eruptions is not stamped by characteristics attributable to a toxicologic property of the chemical substance that causes it. While the localization of the eruption and the history of its occurrence are often of aid in detecting the cause, the clinical appearance guides one only as to probability. For example, while in early summer in northeastern America one would seldom err in attributing a typical eruption to poison ivy, it is important to bear in mind that an absolutely indistinguishable picture could be produced by many other acutely sensitizing agents (e. g., primrose) or even by a chemical burn. In fact, the striking similarity

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* From the Dermatological Service of the Vanderbilt Clinic and the Department of Dermatology, College of Physicians and Surgeons, Columbia University.

between the effects produced by such different substances as rhus and iodine lends support to a hypothesis similar to that advanced by Lewis [1] and others in explanation of a like state of facts in urticaria, viz., that the various exciting agents act not directly, but by stimulating the production (or the liberating) of a common toxic agent which in turn produces the phenomena observed.

While it is common usage to speak of the causative agents of these eruptions as skin "irritants," it is evident that (at least in the concentrations concerned) they are not in themselves irritants to many other persons and, moreover, did not irritate the patient, who now has the eruption, on first contact. Probably, too, a distinction must be made between eruptions of the type referred to and some other occupational dermatoses: for example, the petroleum workers' dermatitis in which the follicular hyperkeratosis and frequent comedo formation seem due to a direct effect of the oil, or the common dermatitis of scrubwomen in which repeated trauma and nonspecific chemical irritation would seem to explain the observed effects.

The point of view is not new—or, on the other hand, undisputed—but the foregoing statements seemed necessary to make clear the points that we wished to bring out in regard to the cases to be reported. The facts to be recorded seem to us to support the belief that we are dealing with a group of cases (at present perhaps only vaguely defined) that are due to sensitization of the skin (epidermis?) to a wide variety of substances not primarily toxic. In at least one instance (potassium mercuric iodide dermatitis) the history of the sensitization is clear. If these are specific sensitizations, it should be possible to detect the causative agent by means of tests. We should like to bring out the practical value of patch tests in the diagnosis of these conditions and also other points that seem to us of aid in understanding the nature of the pathologic process.

THE PATCH TEST

We have employed the method described by Jadassohn [2] as "functioneller Prüfung der Haut," which has been used by numerous investigators in this field. In making the patch, the center of a 4 cm. square of adhesive tape is protected with a 3 cm. square of "Cellophane" or "Silkoid" (to prevent an adhesive tape dermatitis) and on the center of this is placed a 1 cm. square of four-ply gauze which is well covered with the substance to be tested. These patch tests are applied as a routine to the upper posterior part of the chest, which has previously

1. Lewis, T.: The Blood Vessels of the Human Skin and Their Responses, London, Shaw & Sons, 1927, p. 288.

2. Jadassohn, J.: Hautkrankheiten bei Stoffwechselanomalien, Fifth Internat. Dermat. Kong., Berlin, 1904, pt. 2, p. 231.

been cleansed with alcohol. They are allowed to remain twenty-four hours. A patch test is considered positive when a well defined, infiltrated, inflammatory area covered with papulovesicles, vesicles or a bulla occurs at the test site. Almost all of the positive reactions are accompanied by pruritus. In most instances, the positive reaction is present at the end of twenty-four hours; in some instances it occurs earlier, and in others not until forty-eight or seventy-two hours. The reaction persists for from three to fourteen days, and the late reaction is usually indistinguishable from a patch of chronic eczema.

The patch test has the advantage of causing a prolonged contact of the suspected substance with the skin. Probably more important is the fact that it is the epidermal rather than the connective tissue and endothelial cells that are exposed to the test substances. Cooke [3] found that he could obtain satisfactory reactions in *Rhus toxicodendron* sensitiveness by this method, whereas intracutaneous tests failed. Jadassohn, Bloch and others have also emphasized the significance, in respect to dermatitis, of the eczematous type of reaction which the patch test induces as contrasted with the urticarial reaction produced by the scratch or injection methods. It would seem that a positive patch test enables one to detect sensitization of the epidermal cells rather than of the cells of the cutis and its capillaries.

In performing these tests it is essential to know the concentration of the substances that may be used without irritation of the normal skin. It is hoped that the list of such concentrations (page 233) will prove useful to other workers.

REPORT OF CASES

The following are case reports of twenty-one patients suffering from an acute or subacute dermatitis due to sensitization to contact substances. In eighteen of these the patch tests gave positive results. A brief résumé of the pertinent literature is also given.

Phenylenediamine Compounds.—There are numerous references to dermatitis following contact with phenylenediamines, particularly the para compounds. In most instances the inflammation and edema are confined to the head and neck and occur chiefly from the use of hair and fur dyes and occasionally from dyed clothing and some photographic developers. Prosser White [4] stated that the harmful action of the phenylenediamines is direct and chemical, not anaphylactoid, and that

3. Cooke, quoted by Spain, W. C.: Dermatitis Venenata, J. Immunol. **7**:179, 1922. Spain, W. C., and Cooke, R. A.: Dermatitis Venenata: Observations upon the Use of a Modified Extract from Toxicodendron Radicans (L.), ibid. **13**:93, 1927.

4. White, R. Prosser: The Dermatergoses or Occupational Affectations of the Skin, New York, Paul B. Hoeber, Inc., 1929.

sensitization is not called into play. Mayer,[5] on the other hand, demonstrated by means of patch tests a group hypersensitivity in patients with a dermatitis due to paraphenylenediamine and allied chemical substances. He said that a patient with a sensitivity to one of these substances should not engage in trades or use medicaments in which the skin might come in contact with substances with a quinone structure.

Fig. 1 (case 1).—Acute dermatitis with edema following the application of hair dye.

CASES 1, 2, 3, 4 and 5.—The following are case reports of five patients who developed dermatoses following repeated exposure to hair and fur dyes, and in all of whom a patch test to paraphenylenediamine gave positive results. In three middle-aged women (H. McC. [fig. 1], C. K. and V. C.) an acute papulovesicular dermatitis of the head and neck with marked edema of the eyelids developed within twenty-four hours after they had had their hair dyed. One had used "Inecto," and the other two were unable to tell what dye had been applied. In all

5. Mayer, R. L.: Die Hautüberempfindlichkeit gegen Körper von Chinonstruktur, Arch. f. Dermat. u. Syph. **156**:331, 1928; **158**:266, 1929.

three the hair had been dyed previously, and in two redness and itching of the scalp had developed. In a fourth patient (L. B.) a slight rash with pruritus developed about two days after she had worn a new black fox scarf. She continued to wear this scarf for a week. On examination ten days after the onset of her symptoms, the patient had an acute vesicular eruption of the neck. She exchanged this "mineral" dyed scarf for a "vegetable" dyed scarf of the same fur. She wore the second scarf without recurrence of the dermatitis. The patient's skin remained clear for about six months, and then a wrist-band dermatitis developed almost immediately after she had worn an inexpensive shiny black ribbon on her wrist watch. She substituted a gray ribbon and later a silver bracelet without a recurrence of the dermatitis. This patient gave a history of having had her hair dyed black two or three times about ten years previously. The fifth patient (M. M.), who had been a furrier for twenty-seven years, stated that the raccoon furs he had handled during the past few years were dyed furs. He gave a history of intermittent swelling of the eyelids, transient eruptions on the face and hands which left brown spots, and headaches of six months' duration. He also had a chronic cough. On examination, the patient showed a moderate thickening and edema of the eyelids with a brownish pigmentation of the lids and surrounding area, a slight erythematous eruption of both wrists with scattered papules and an erythematous patch on the left thumb covered with papulovesicles. His general condition was normal, except for nasal polypi and chronic sinusitis. As long as the patient stayed away from his trade, his skin remained normal.

These five patients gave a positive patch test to 10 per cent p-phenylenediamine. Scratch tests to this substance were done on two of the patients and gave positive results. All other skin tests (including patch and scratch tests to raccoon on the patient with fur dye dermatitis) gave negative results.

Passive transfer of sensitivity was negative. This included: (*a*) the Prausnitz-Küstner [6] method, the blood serum of two patients with hair dye dermatitis and that of the furrier being used; (*b*) the Urbach-Königstein [7]-Perutz [8] method, the vesicle fluid from a positive patch test of one patient with hair dye dermatitis being used, and (*c*) an attempt to induce passive anaphylaxis in guinea-pigs by intraperitoneal injections of the serum of the patient with the fur dye dermatitis and of one of the patients with dermatitis caused by hair dye.

Sodium Bichromate.—The recognition of the polymorphic dermatosis caused by chrome compounds began about a century ago. These have been well outlined by White.[4] Bloomfield and Blum [9] found that in six of fourteen workers engaged in chrome plating less than twenty months

6. Prausnitz, C., and Küstner, H.: Studien über die Ueberempfindlichkeit, Zentralbl. f. Bakteriol. **86**:160, 1921.

7. Urbach, E.: Ueber passiven Uebertragung der Ueberempfindlichkeit und zur Desensibilisierung allergischer Hautkrankungen, Arch. f. Dermat. u. Syph. **154**:550, 1928; Die Bedeutung der Haut als Immunitätsorgan, Ztschr. f. Immunitätsforsch. u. exper. Therap. **55**:471, 1928.

8. Perutz, A.: Beiträge zur Klinik, Pathogenese und Therapie der Turpentindermatitis, Arch. f. Dermat. u. Syph. **152**:617, 1926.

9. Bloomfield, J. J., and Blum, W.: Health Hazards in Chromium Plating, Pub. Health Rep. **43**:2330, 1928.

"chrome holes" developed. They expressed the belief that there is a real, though not critical, hazard in chromium plating. In a patient with an occupational dermatitis due to bichromate Parkhurst [10] was able to produce a localized erythematopapular dermatitis by rubbing a solution of potassium bichromate into a normal skin area.

CASE 6.—M. N., a printer, engaged in a shop where the chromium plating process was used, for six months previous to the appearance of an eruption had frequently dipped his hands and arms in a 0.1 per cent solution of sodium bichromate. His hands became rather rough, but no eruption developed. After about six months the dorsa of his hands and the flexor surfaces of his forearms became erythematous and a few pimples appeared. The patient continued to work until an erythematous, maculopapular and oozing vesicular eruption developed on the forehead, hands, forearms and the extensor surfaces of the legs. He remained away from work for a few weeks, and the eruption cleared up entirely. He then became a salesman for the same firm, and noted that the eruption recurred when he returned to the shop. Patch tests using 0.1 and 1 per cent sodium bichromate were applied to normal and previously sensitized skin, respectively; both gave positive results. The routine patch tests (page 233) gave negative results. Passive transfer of sensitization with the patient's serum (Prausnitz-Küstner) was unsuccessful. Twice when the patient was entirely free from the dermatitis he worked in the shop where the chrome process of printing was in progress, but he did not come in contact with the solution. Each time an acute exacerbation occurred on his hands.

Novocaine and Novol.[11]—Lane [12] observed an occupational dermatitis in two dentists who had employed procaine over a considerable length of time and in a third who had used novol for a short period as a local anesthetic. By means of skin tests and the history of exacerbation of the dermatitis on reexposure to these drugs, his diagnoses were confirmed. Since then there have been occasional reports of novocaine dermatitis among dentists. This dermatitis has been confined mostly to the hands, but in some instances a dermatitis of the face has developed. This usually followed the accidental squirting of the face with the solution while infiltrating the patients' tissues. Gaskill [13] and Silber [14] expressed the belief that a sensitivity to novocaine in dentists is extremely rare, and that the dermatitis is usually due to frequent cleansing and contact with antiseptic solutions. Galewsky [15] reported that an increas-

10. Parkhurst, H. J.: Dermatosis Industrialis in a Blue Print Worker Due to Chromium Compounds, Arch. Dermat. & Syph. **12**:253 (Aug.) 1925.

11. Novol is a proprietary local anesthetic containing procaine, supranol, chlorbutanol and Ringer's solution.

12. Lane, C. G.: Occupational Dermatitis in Dentists: Susceptibility to Procaine, Arch. Dermat. & Syph. **3**:235 (March) 1921.

13. Gaskill, H. K.: Procaine Dermatitis Among Dentists, Arch. Dermat. & Syph. **6**:576 (Nov.) 1922.

14. Silber, D.: Gibt es eine Novocaindermatitis als eine Berufskrankheit der Zahnärtzte, Deutsche Monatschr. f. Zahnh. **46**:338, 1928.

15. Galewsky: Ueber Novokaindermatitiden bei der Anwendung von Novokain-Augenwasser, Dermat. Wchnschr. **85**:1195, 1927.

ingly severe dermatitis of the face developed following the use of a novocaine eye wash for relief from hay-fever conjunctivitis. Following are the case reports of two patients, one exhibiting a sensitivity to procaine and the other to novol.

CASES 7 and 8.—Two patients were admitted to the clinic with an acute dermatitis of the face and edema of the lids. In the former, a physician, a dermatitis would develop while he was on duty in the operating room; if not too severe, it would clear up over the week-end when he was not on duty. Patch tests to substances with which the patient might come in contact gave negative results, with the exception of 1 per cent novocaine. This reaction was strongly positive. The patient volunteered the information that when he infiltrated patients' skin with novocaine, it frequently squirted on his face. Since the time of admission his face has remained free except on two occasions, when he accidently allowed novocaine to come in contact with his eyelid. The other patient (L. M.) gave a history of having had two teeth extracted under local anesthesia two months previously. One week previous to her present illness she had had two teeth extracted, and two days later the eruption began to appear on her face. Three days later she had another extraction under local anesthesia, and following this the dermatitis became worse. The patient's dentist supplied us with the medicaments that he had used; they included aconite, iodine and novol. Tests were applied, these substances, as well as novocaine, potassium iodide and iodoform, being used. The patient gave a strongly positive reaction to novol. The other tests gave negative results. The Prausnitz-Küstner transfer, the patient's blood serum being used, was unsuccessful.

Potassium Mercuric Iodide.—Dermatitis developed in one patient after contact with this substance.

CASE 9.—A nurse (L. L.) was admitted to the hospital with a marked dermatitis of the dorsa of the hands (fig. 2). It consisted of an acutely circumscribed area of intense erythema covering the dorsum of each hand and surmounting this, on the left, a vesicular and bullous eruption. Six weeks previously the patient had applied 1:20 solution of potassium mercuric iodide to her hands for several minutes. She had mistaken this solution for hand lotion. No eruption had developed. Three weeks later the patient cared for a patient with a contagious disease, and scrubbed her hands frequently and vigorously, using a hand brush that had been soaking in a 1:5,000 solution of potassium mercuric iodide. Following this a moderate vesicular dermatitis of the dorsa of the hands developed, which required about two and one-half weeks to heal. She then returned to duty and again scrubbed her hands, using the aforementioned technic. As soon as she began to scrub, the dorsa of her hands began to burn and became inflamed, and within a few hours the dermatitis that was described had developed. Routine patch tests applied to the patient's back gave entirely negative results, with the exception of the area where the patch test to 1:5,000 potassium mercuric iodide had been applied. Here there was a small infiltrated erythematous patch. Passive transfer (Prausnitz-Küstner) with the patient's blood serum was unsuccessful. A few days later patch tests were applied for three hours to the following areas: (*a*) the back (which had not been in contact with potassium mercuric iodide and on which a dermatitis had not developed, (*b*) the forearm (which had been in contact with potassium mercuric iodide but on which a dermatitis had not developed) and (*c*) the dorsum of the hand (which had been in contact with potassium mercuric iodide and had recovered from two attacks of potassium mercuric iodide

dermatitis). On the first area (*a*) a small, raised, infiltrated, erythematous patch developed, as in the previous test; on the second area (*b*) (fig. 3), a similar erythematous patch developed, with four vesicles, and the third area (*c*) was covered by a bulla on an erythematous base which went on to necrosis. An attempt has been made to desensitize this patient locally. She began by applying a 1:100,000 solution of potassium mercuric iodide to the dorsum of the hands for a minute daily; the time was gradually increased to ten minutes. This was continued, the concentration being increased to 1:5,000 for five minutes. The patient is now scrubbing her hands with a brush soaked in potassium mercuric iodide, 1:5,000. There has been no recurrence of the dermatitis.

Fig. 2 (case 9).—Acute dermatitis of the hands due to potassium mercuric iodide.

Primose (Primula obconica).—The scholarly work on primrose dermatitis has probably been the greatest contributing factor in the conception of the mechanism of dermatitis venenata. Beginning with the pioneer work of White,[16] Lewin[17] and Nestler,[18] which has been

16. White, J. C.: Oral Communications on Primrose Dermatitis, Boston M. & S. J. **122**:425, 1890.

17. Lewin, quoted by Hoffman, E.: Ueber eine durch Scilla martina hervorgerufene vesikulose Dermatitis nebst Bemerkungen über die Bedeutung der Raphiden, Dermat. Wchnschr. **41**:92, 1905.

18. Nestler, quoted by Cohn, F.: Beiträge zur Biologie der Pflangen, Festschrift für A. Nestler, Breslau, Kern, 1929.

confirmed and amplified particularly by Simpson,[19] Low [20] and Bloch and Steiner-Wourlisch,[21] it has been demonstrated repeatedly that many persons are sensitive, and that others can be sensitized to primrose. A typical dermatitis venenata has been produced in either a normal person or one sensitive to primrose, by the repeated application of either the juice or the nonprotein extract of the leaf. With a sufficiently concentrated nonprotein extract of primrose, Bloch [21] was able to sensitize the skin of volunteers to primrose in every instance. Perutz and Rosner [22] have passively transferred primrose sensitivity by using the serum from a spontaneous bulla in two patients with primrose dermatitis.

Fig. 3 (case 9).—The central area of erythema surmounted by four vesicles followed the application of a potassium mercuric iodide patch test in a diluiton of 1:5,000 for three hours.

The Prausnitz-Küstner method of passive transfer and animal sensitization, either actively or passively, have failed. Simpson [19] stated that primrose dermatitis is a "skin anaphylaxis," a symptomatic expression

19. Simpson, C. A.: Primrose Dermatitis and Its Relation to Anaphylaxis, J. A. M. A. **69**:95 (July 14) 1917.

20. Low, R. Cranston: Anaphylaxis and Sensitization, Edinburgh, W. Green & Son, 1924.

21. Bloch, B., and Steiner-Wourlisch, A.: Die willkürliche Erzeugung der Primelüberepfindlichkeit beim Menschen und ihre Bedeutung für das Idiosynkrasieproblem, Arch. f. Dermat. u. Syph. **152**:283, 1926. Bloch, B.: Rôle of Idiosyncrasy and Allergy in Dermatology, Arch. Dermat. & Syph. **19**:175 (Feb.) 1929.

22. Perutz, A., and Rosner, R.: Zur Frage der Allergie bei der Primel dermatitis, Arch. f. Dermat. u. Syph. **156**:509, 1928.

of cell hypersensitiveness established spontaneously and not dependent on any immunologic process.

CASES 10, 11 and 12.—Three patients were admitted to the hospital with an acute vesicular dermatitis of the hands. One of these patients developed a dermatitis of the face and neck together with edema of the lids following a vesicular dermatitis of the hands. One patient's lesions had been diagnosed as trichophytosis. All three patients were housewives and had primrose plants in the home. Each brought a leaf from one of her primrose plants, and these were used for patch tests. All of the tests gave postive results. The plants were removed from the homes, and there was no recurrence of the dermatitis.

Poison Ivy (Rhus toxicodendron, Toxicodendron radicans L.).—For many years the term dermatitis venenata connoted a sensitization of the skin to plant proteins, usually poison ivy. McNair [23] studied the pharmacology and chemistry of poison ivy in detail. By means of patch tests Cooke [3] was able to reproduce in seven persons the typical vesicular lesion of poison ivy in susceptible persons with the extract of *Rhus toxicodendron*. Intradermal tests with this extract gave negative results. Spain [24] corroborated this work and also demonstrated differences in susceptibility and incubation period in persons sensitive to ivy. Strickler,[25] on the other hand, obtained positive reactions in patients sensitive to ivy by intradermal injections of ivy extracts. Biberstein,[26] who sensitized patients to *Rhus* by repeated cutaneous applications and by repeated patch tests, showed that there is a variation in sensitivity from year to year. The freedom from dermatitis venenata (*Rhus*) enjoyed by the American Indians who ate a few ivy leaves is undoubtedly a primitive example of temporary desensitization and specific tissue immunity. More recently, Strickler,[25] Schamberg [27] and Spain [24] reported the temporary desensitization to ivy by oral or intramuscular administration of ivy extract.

CASES 13, 14, 15 and 16.—In two children (J. P. and T. M.) an acute vesicular grouped dermatitis of the upper and lower extremities developed after exposure to poison ivy. In two adults (M. M. and M. C.) an acute vesicular and bullous dermatitis of the extremities and neck developed following exposure to poison ivy. For a number of seasons, both had been in contact with poison ivy without ever developing a dermatitis. Patch tests with the extract of poison ivy gave positive results in all four patients.

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23. McNair, J. B.: Rhus Dermatitis, Chicago, University of Chicago Press, 1923.

24. Spain, W. C.: Dermatitis Venenata, J. Immunol. **7**:179, 1922.

25. Strickler, Albert: The Treatment of Dermatitis Venenata by Vegetable Toxins, J. Cutan. Dis. **36**:327, 1918; The Toxin Treatment of Dermatitis Venenata, J. A. M. A. **77**:910 (Sept. 17) 1921.

26. Biberstein, H.: Ueber Hautreaktionen bei Applikation von verschiedenen Rhusarten, Klin. Wchnschr. **8**:99, 1929.

27. Schamberg, J. F.: Desensitization of Persons Against Poison Ivy, J. A. M. A. **73**:1213 (Oct. 18) 1919.

Insecticides.—Most of the common household insecticides contain pyrethrum or sodium fluoride. McCord, Kilker and Minster [28] observed a number of occupational dermatoses due to the handling of pyrethrum. These writers also reported an anaphylactic reaction occurring in a plant engineer when he was exposed to pyrethrum dust.

Cases 17 and 18.—A zoologist (G. L.) had a persistent dermatitis of the face, neck, dorsa of the hands and forearms and intermittent asthmatic attacks of a year's duration. These symptoms cleared up while he was on vacation and recurred when he again began to work with laboratory animals. On examination, the aforementioned areas showed a diffuse erythematous, scaling eruption with slight infiltration. In addition, there was slight edema of the lids and groups of erythematous papules on the forearms. Patch, scratch or intradermal tests were made to most of the contact and inhalant substances about the laboratory. The patient gave a positive reaction to patch tests of the pyrethrum-containing insecticides ("Black Flag" and "J-O") and delayed positive reactions to intradermal tests of pyrethrum and timothy. All other tests gave negative results, including a scratch test to pyrethrum. Passive transfer of pyrethrum sensitivity by the Prausnitz-Küstner method was unsuccessful. Since this time (three months) he has continued his work, substituting a sodium fluoride-containing insecticide for the one containing pyrethrum. His skin has remained clear, and his asthma is somewhat better. The patient also has a low grade pulmonary tuberculosis.

A patient (A. H.[29]) with an alcoholic psychosis gave a history of having sprayed her bed with "J-O" insecticide twelve hours before sleeping in it. After sleeping for about two hours she awoke with an intense itching and burning of the face and neck. Before morning a generalized eruption "like measles" had developed, and within the next two days her eyelids became swollen and shut, and the face was covered with an "oozing eczema." The patient had used this insecticide previously but had not sprayed her bed linen with it. She gave a history of having had five years previously a similar eruption which was limited to the face and neck. At that time a pharmacist recommended that she discontinue wearing a new black fur collar. She did this, and the eruption cleared up promptly. On examination a week after the onset of the present skin condition, the patient had a diffuse, moderately infiltrated, erythematovesicular and papular eruption of the face, neck and upper part of the trunk. Excoriated papules, small vesicles and crusted lesions were scattered over these areas and the extremities. Patch tests to "J-O" insecticide powder gave positive results; a percutaneous test to "J-O" gave a delayed positive reaction, while the intradermal test to pyrethrum gave negative results. A patch test to p-phenylenediamine and to intradermal test to staphylococcus toxin gave positive reactions. All other tests (epidermal, contact and foods) gave negative results. Prausnitz-Küstner transfer, the patient's blood serum being used, was unsuccessful to both paraphenylenediamine and pyrethrum. With lotions and the avoidance of insecticides, the lesions cleared up in about a month. Two months later the patient forgot and used another insecticide containing pyrethrum; almost immediately an acute dermatitis of the face developed.

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28. McCord, C. P.; Kilker, C. H., and Minster, D. K.: Pyrethrum Dermatitis, J. A. M. A. **77**:448 (Aug. 6) 1921.

29. This patient was presented at the New York Academy of Medicine, Section of Dermatology (Hopkins: Dermatitis Venenata [Insect Powder], Arch. Dermat. & Syph. **21**:863 [May] 1930).

Cosmetics.—Cole,[30] in answer to his questionnaire, received 137 reports of injuries due to cosmetics. Nine were from face creams, five from powder and one from mascara. Reports of positive patch tests or transfer of sensitivity are lacking. In the three patients whose case histories follow eruptions developed on the face after the use of the same cosmetics for a varying period of time.

CASE 19.—An actress (V. H.) gave a history of intermittent erythema and edema of the eyelids for six months. The edema occurred each time following the use of "make-up." Patch tests of the various cosmetics that the patient used were applied to the posterior part of the chest and gave negative results. She then began applying the cosmetics to the face individually. Within a few hours after brushing mascara on her eyelashes, the edema and erythema of the lids recurred. She then used all the other cosmetics with the exception of mascara, and the edema did not recur.

CASE 20 and 21.—Two patients (L. D. and A. G.) complained of eruptions on the face following the use of cold cream and face powder, respectively. The former had an erythematous macular eruption of the cheeks with edema of the lids, and the latter, a disseminated papular and papulovesicular eruption on the face. Patch tests of the various cosmetics that the patients used were applied to the back and gave negative results. Reapplication of the cold cream and powder in each instance caused a recurrence of symptoms. Both have remained free from lesions since they have discontinued the use of these particular cosmetics.

COMMENT

A history of a previous skin eruption was given in only one instance, case 16, and this was probably due to another external irritant (p-phenylenediamine). G. L. (the patient with pyrethrum dermatitis, case 17) had asthma. In this patient the presence of a positive delayed intradermal reaction to timothy, the fact that the asthmatic attacks persisted although the dermatitis completely cleared up when he abandoned the use of pyrethrum and the presence of pulmonary tuberculosis all speak against pyrethrum being the cause, at least the sole cause, of the asthma. The absence of other allergic symptoms, such as urticaria, eczema, hay-fever and asthma, in the remaining patients is striking and seems rather significant. Of twenty-one patients, nineteen gave a history of previous and usually repeated exposure to the offending substance without effect. This period varied from a few months to ten or twelve years. In the others, previous exposure was probable and certainly could not be excluded. One history points convincingly to sensitization. A nurse applied a 1:20 solution of potassium mercuric iodide to her hands, thereby sensitizing the epidermal cells. Later she scrubbed her hands with soap and water, using a brush that had been soaking in a 1:5,000 solution of potassium mercuric iodide, and a

30. Cole, H. N.: Investigation of Injuries from Hair Dyes, Dyed Furs and Cosmetics, J. A. M. A. **88**:397 (Feb. 5) 1927.

dermatitis developed (an allergic reaction). After recovery she repeated the scrubbing and again a similar dermatitis developed.

The eruptions were due to the patients' occupation in five of the twenty-one cases. Four of the cases occurred in men, two in children and the remaining fifteen in women. Most of the sensitizing substances detected in these cases have previously been recognized as causes of dermatitis. Potassium mercuric iodide (an antiseptic of local popularity) has apparently not been recorded. In this clinic it has repeatedly been suspected of being the cause of dermatitis of the hands, but in the absence of tests it is impossible to be certain of its frequency. With the exception of the plants, none of the sensitizing substances are protein, and in the case of ivy and primrose it has been shown that sensitization is possible with the nonprotein extracts. None is an irritant to most persons, with the possible exception of ivy. There is no apparent chemical similarity between them, but experience suggests that their essential characteristic is not their primary toxicity but their peculiar property of skin sensitization. A number of contact substances, such as poison ivy, primrose, formaldehyde, turpentine and nickel, are known to sensitize a number of people when contact with them is frequent or intensive.

As a diagnostic aid or in order to establish the necessary non-irritative concentration, routine patch tests were made on about 100 patients with eczema, urticaria, hay-fever, asthma or dermatitis venenata not due to any one of the substances tested. These patch tests gave uniformly negative results. They included:

Para-phenylenediamine, 10 per cent alcoholic solution
Resorcin, 1 per cent alcoholic solution
Formaldehyde, 1 per cent aqueous solution
Potassium mercuric iodide, 0.05 per cent aqueous solution
Rhus toxicodendron (Lederle), oily solution, diluted 1:5
Iodoform gauze impregnated with 5 per cent iodoform
Ammoniated mercury, 5 per cent in petrolatum
Sulphur, 10 per cent in petrolatum
Potassium iodide, 50 per cent in petrolatum
Orris root, 10 per cent in petrolatum

Similarly, patch tests gave negative reactions in at least twenty patients not suffering from a dermatitis due to the following substances:

Tincture of pyrethrum, U.S.P., undiluted
Tincture of veratrum viridi, U.S.P., undiluted
Nicotine salicylate, 10 per cent aqueous solution
Sodium fluoride, 1 per cent aqueous solution
Sodium bichromate, 1 per cent aqueous solution
Novocaine, 1 per cent aqueous solution
Lysol, 1 per cent aqueous solution
"Black-Flag" insecticide powder, undiluted
"J-O" insecticide powder, undiluted
"White Henna" powder, undiluted
Novol solution as used on Patient L. M. (case 8)

From the foregoing observations one may conclude that a positive patch test with one of the aforementioned substances means that the patient's skin is sensitized to that substance and, with the exception of potassium iodide, that the patient probably has or has had an eruption due to the substance. The negative patch tests indicate that sensitization to these substances without the development of an eruption is unusual.

On examination, nineteen of the patients were suffering from an acute, and two from a subacute, dermatitis. The type of dermatitis was essentially the same, whether it was a dermatitis venenata or an occupational dermatitis. The acute dermatitis was usually a rather localized erythema with slight edema which developed into either an acute exudative type, with formation of papulovesicles, vesicles, or bullae, or a superficial exfoliation. A generalized eruption was present in A. H. (case 18), who had slept on an insecticide-laden bed. In the other patients the dermatitis began on the exposed parts of the body and tended to remain localized. The lesions occurred most frequently on the face and hands. An acute dermatitis of the face and edema of the eyelids occurred in twelve patients, in ten of whom both conditions were present; this was frequently accompanied by a dermatitis of the neck. This localization of the eruption occurred in all patients following the application of hair dyes, and occurred in these areas as well in patients who had used insecticides and on all of the patients with a primrose dermatitis. Of the twelve patients with a dermatitis of the hands, only three cases remained localized; eight patients had a dermatitis of the arms as well, and six had a similar eruption on the legs. In the majority of instances, the attacks seemed due to repeated contact of the causative substance with the skin. (Jadassohn:[31] "durch von aussen an die Haut herantretende Reizwirkungen gegen wiederum von aussen an sie herantretende" [external skin sensitization due to external contact]. In the case in which novol was used, one must be noncommittal. The history was that the drug was injected into the gums and the eruption appeared on the face, but the possibility of contact of the fluid with the face certainly cannot be excluded. In no instance, on the other hand, could the possibility that some of the exciting substance was absorbed be ruled out, though the restriction of the eruption to exposed areas while other areas usually responded to patch tests speaks against this.

The chronicity of the lesions ran parallel with the continued exposure to the causative agent; likewise, the recurrence corresponded to the reexposure to the substance causing the dermatitis. Subsequent contact with this agent caused a recurrence of the dermatitis. The reaction

31. Jadassohn, J.: Bemerkungen zur Sensibilisierung und Desensibilisierung bei den Ekzemen, Klin. Wchnschr. **21**:1680 and 1734, 1923.

was specific in all cases in that the substance used caused no reaction in normal persons and the patient reacted only to the skin-sensitizing substance or substances. At least, no general increased irritability of the skin was evident. The patch test gave positive results in all except the three cases due to cosmetics, and in these the reapplication of the cosmetic by the patient with recurrence of the eruption seems equivalent to the application of a patch test in a locally sensitized area.

Percutaneous tests were done on six of the patients who gave positive reactions to the patch test to either insecticides or p-phenylenediamine and five of these were positive. The sixth gave a negative scratch but a positive delayed intradermal test to pyrethrum; this would indicate that the sensitivity is not always confined entirely to the cells of the epidermis. On the other hand, in one patient who showed a positive patch test to "J-O" and "Black Flag," the scratch and intradermal tests with pyrethrum, the active ingredient of these powders, produced no wheal.

The blood serum of nine patients giving positive reactions to the patch test was investigated for circulating antibodies by the Prausnitz-Küstner method or a slight modification of this method consisting of the application of the antigen to the site where the sensitive person's serum was injected, as a patch rather than as a scratch or an intradermal test. All tests gave negative results. This is in contrast to the fact that we have repeatedly had positive transfers to foods in chronic eczema and urticaria. It may be that the modification of the method was at fault in some instances. However, a review of the literature would indicate that when patients have been sensitized by the contact of substances with the skin (formaldehyde, ursol, primrose, mercury, hops, iodoform, quinine, chamomile, adhesive plaster) attempts to demonstrate circulating antibodies by the passive transfer method of Prausnitz and Küstner have given uniformly negative results. Three cases reported by Biberstein [32] constitute possible exceptions. In these a dermatitis followed the use of atropine as eye drops, and on passive transfer of this sensitivity by their serum an erythematous reaction developed. The question arises, however, whether there might not have been an absorption of the atropine through the conjunctiva and sensitization of the skin from within and also whether an erythematous type of reaction is as significant of passive transfer as an urticarial or an eczematous manifestation. On the other hand, there are several facts which suggest that dermatitis due to contact substances results from the local presence of specific antibodies. These are the nontoxic character of the exciting substance, the nonspecificity of the reaction and the frequent history

32. Biberstein, H.: Zur Atropinüberempfindlichkeit, Arch. f. Dermat. u. Syph. **154**:555, 1928.

of previous and probably sensitizing exposure. Moreover, the presence of antibodies in the blister fluid of patients with a dermatitis due to contact substances has apparently been demonstrated by the Urbach-Königstein, Perutz or the Lehner-Rajka [33] method of passive transfer in turpentine, iodoform, primrose, atropine, adhesive plaster, metol, rodinal and procaine hypersensitivity. These observations, if confirmed, seem to prove the presence of antibodies in the skin which pass into the fluid of a superimposed blister. Doerr [34] suggested that specific local desensitization would also be confirmatory evidence of the presence of such antibodies. We believe that we have obtained such evidence in the case of potassium mercuric iodide dermatitis.

These results speak against a general sensitization of the body; so does the ability of patients with poison ivy to tolerate ingestion or intramuscular injection of the toxin. The positive patch tests indicate a general sensitiveness of the epidermis, but there is distinct evidence that this sensitiveness is at least exaggerated in some areas of the skin if not strictly limited to them. In the case due to potassium mercuric iodide, the reaction was intense in the area on the hand where the sensitizing exposure took place, moderate on the adjacent skin of the forearm and faint on the back. In the cases due to cosmetics, no sensitization could be detected on the skin of the back, although the face reacted. For that matter, in none of the cases did the positive patch test on the back react to the sensitizing substances as strongly as the substances did on the area first sensitized. The phenomenon of local sensitization was clearly brought out by Jadassohn [31] in his case of odol dermatitis. Sensitization occurred in brushing the teeth, and the eruption appeared on the lips and right index finger. After the eruption had subsided, patch tests gave a strong reaction on the right index finger, a weak reaction on the right forearm and a negative reaction on the left index finger.

It is of interest that in these localized and usually transitory eruptions called dermatitis venenata, the sensitization seems localized to the epidermis, whereas in the more chronic and generalized eruptions, usually classed as eczema, the sensitization appears to be widespread. At least positive intradermal tests and positive Prausnitz-Küstner reactions are frequently found, and the concurrence of asthma, hayfever, urticaria or intestinal allergy is also more frequent in the latter group. The differences between these two conditions may be those of degree rather than of kind, but they are obvious clinically and must have an underlying cause.

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33. Lehner, E., and Rajka, E.: Allergieerscheinungen der Haut, Halle, C. Marhold, 1927.

34. Doerr, R.: Ueber Allergie und allergische Hauterkrankungen, Arch. f. Dermat. u. Syph. **151**:7, 1926.

SUMMARY

In eighteen of a series of twenty-one patients suffering from dermatitis venenata or occupational dermatitis, the etiology was determined or corroborated by patch tests. In the remaining three there was an exacerbation of the dermatitis when the substances were applied to the sensitized skin. In all of the cases there was freedom from dermatitis when the specific substance was avoided.

The sensitizing substances were: paraphenylenediamine, sodium bichromate, novocaine, novol, potassium mercuric iodide, primrose, poison ivy, pyrethrum, mascara, face powder and face cream. In the dilutions used, none of these substances was found irritating to the normal skin.

Passive transfer of sensitization was unsuccessful.

A case of local sensitization and desensitization to potassium mercuric iodide is reported.

In most instances dermatitis venenata and occupational dermatitis result from local cellular sensitization to specific nonproteins acquired by previous contact of the substances with the skin.

VERRUCAE *

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The subject may seem trifling, but it is nevertheless full of interest, and furthermore, the physician must always bear in mind that for the patient there are no trifles.

JUVENILE OR FLAT WARTS, OR VERRUCAE PLANAE

Juvenile or flat warts, or verrucae planae, sometimes also called "shaving warts," consist at first exclusively of an increase in the upper layers of the epidermis. Later the lower epithelial layers become thickened and the papillae elongate upward, but the lesion nevertheless remains a superficial one, a true acanthoma. This superficiality is an important feature, because when the lesion is curetted off, the raw surface lies flush with the rest of the skin, and on healing no scar results. The sprouting up of the papillae, however, causes free bleeding as the capiliary loops are injured. This bleeding need not alarm one for the future, as the papillae retract, leaving no scar.

The treatment is based on the aforementioned anatomic features, and on the knowledge that the condition is due to a contagium. The condition of the skin, whether fatty or sweaty, must also be taken into consideration.

The affected surfaces are first well soaked with a warm, saturated solution of boric acid. As these surfaces are usually the lower part of the face, the forehead and the back of the hands, this is best done by making the solution in a washbowl, by seating the patient before it and by having him apply a towel moistened in the solution, as a barber does, for a prolonged time. Two heaping tablespoonfuls of the powder to a bowl is about the right proportion. This soaking softens the skin, especially the loose cells at the top of the verrucae, by imbibition, and it also enlarges and renders the verrucae more prominent, which is important, as in this way minute lesions that would otherwise escape observation are brought into view. Other factors of importance are that the warts, being soft, are more easily scraped off with the curet, and the pain, which otherwise is acute, is in this way much diminished and made tolerable even to children.

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The curetting may advantageously be interrupted, giving a rest to both patient and physician, and in the intervals the patient may soak his face with the boric acid solution, which lessens the bleeding and increases the chances for finding elusive verrucae. Another great aid in searching for these minute lesions is the binocular loupe. These spectacles will also be found of great value in the examination of other conditions, as they give a relief picture and leave the hands of the operator free. Our attention was first drawn to this instrument by a dentist, and now it is indispensable to us.

After all the lesions found have been curetted, and the bleeding has ceased, the next step is to anesthetize the denuded surfaces preparatory to applying glacial acetic acid. Local anesthesia of denuded surfaces without the employment of a hypodermic needle is an important technical procedure in many of the small surgical maneuvers in dermatology, and depends on the fact that procaine hydrochloride solution is absorbed as readily by surfaces denuded of their horny layer as by a delicate mucous membrane. The solution employed is most conveniently made with the pellets of procaine and epinephrine used by dentists. Shaeffer gave the following formula for such tablets as made in Germany: procaine hydrochloride, 0.125 Gm. and epinephrine, 0.00012 Gm.[1] Half a dozen of these pellets are dissolved in a half teaspoonful of water and swabbed on the denuded surfaces with a piece of cotton twisted on a toothpick. In a few minutes the pale epinephrine wheal appears, and then the raw surfaces may be touched with glacial acetic acid. This, when applied to the skin, is strongly rubefacient and, unless procaine hydrochloride is used first, painful. It, however, does not cauterize, which is important. The cauterizing acids should not be employed. The application of the glacial acetic acid again incites bleeding, which is beneficial in sweeping out any remaining virus. This bleeding subsides with the resumed use of the boric acid solution.

An antiseptic ointment is prescribed, consisting of salicylic acid (1 drachm) in boric acid ointment (2 ounces). The patient should be instructed first to soak thoroughly and for a long time the affected parts with a saturated solution of boric acid, and, after drying the parts, to rub in the ointment, as a daily treatment. The boric acid has a drying effect on the skin which is beneficial, as undoubtedly a moist, fatty skin is more inclined to produce warts than a normal one. At each succeeding visit diligent search should be made with the binocular loupe for new warts, and any verrucae vulgares, for instance, on the hands, should also be removed. Although there are many clinical differences between these two classes of warts, they probably are due to the same virus.

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1. Schaeffer, J.: Die Therapie der Haut und Geschlechskrankheiten, Berlin, Urban & Schwartzenburg, 1915.

VERRUCA VULGARIS

In regard to the removal of verruca vulgaris, attention should also be paid, as with verruca plana, to its anatomy. Verruca vulgaris is countersunk in the tissues, and the downgrowth is accomplished by the extension downward of the interpapillary rete which extends downward as nubs. The lesion can be tipped out by pressing the edge of the curet against its side and dragging on it, or by prying it up as one would do in evulsing a tooth. This procedure is quite different from trying to scoop it out. The growth should come out clean; its undersurface can be seen under a low power lens to consist of glistening nubs. The cavity from which the wart has been evulsed is usually deep and bleeds freely because the tops of the papillae with their capillary loops are torn away and opened. Under a boric acid compress the bleeding gradually ceases.

The analogy of a wart to a tooth is striking, as the body of the wart corresponds to the body of the tooth, and the extension downward of the nubs to the fangs. Frequently each downgrowth is tipped by a glistening white nub. Also frequently the downgrowths are astonishingly deep. A short time ago we evulsed a wart from the volar surface of the thumb, the top of which was flush with the cutaneous surface, caused by the patient clipping it and by his work. It evulsed easily and completely, and it measured 6 mm. from the flat top to the tip of the longest nub. The hole left after such an evulsion is naturally both large and deep, but it has not the same significance as a correspondingly deep hole left after curetting a cancer, although both are caused by epithelial downgrowths. In cancer, the hole results from the erosion and destruction of tissue; that left by a wart occurs simply by displacement, and it closes up when the tissues resume their normal position. As will be shown later, it is important to bear in mind the depth of such warts in treating them with radium.

After evulsion, the bottom of the cavity, however, is still lined with epithelial cells, as can be seen in any of the numerous illustrations of perpendicular microscopic sections of such warts. The cavity may now be cleaned out with a narrow curet and then cauterized with trichloracetic acid. To do this a very little water is added to some trichloracetic acid crystals, and the cavity is swabbed out with cotton twisted on a toothpick dipped in this fluid. A peculiarity of this acid is its affinity for epithelial cells, especially fatty ones, as is shown by its turning them dead white. This must be due to its great content of chlorine, as the acids in the same series with a lesser chlorine content do not have this action. Trichloracetic acid, however, is not a good hemostatic, and the bleeding from the cavity may continue. This may be controlled by pinching up the skin where it is loose or by traction on two sides of

the cavity over a bone, as for instance over a phalanx, and then applying the acid to the nonbleeding surface.

All verrucae vulgares do not tip out in this way. For instance, those on the scalp scrape off level with the surrounding skin, and many of those of the sole, palm and nail-bed fall, as regards treatment, into a totally different class.

All of these procedures take time. Each step must be carried out deliberately and slowly. This cannot be avoided, and even with the greatest care recurrences will take place, but with persistence the final results are good.

The choice of a curet is important. Those with a thin shank and a correspondingly thin handle meant to be held like a pen are poor instruments for this work and for routine work on the skin. A curet should have a stout shank and a capable handle, no matter how small the cutting surface may be. Bone curets, such as those used by orthopedists, are the best. Physicians forget that the skin is tough, in many ways as tough as any bone. With such an instrument one can cut as deep as necessary, and one can also tell when one has reached sound tissue.

The method cited is the most reliable treatment for warts in general that we have found, better than that with electrical appliances. Many other treatments have been recommended, but many of them are unreliable in their results and frequently inconvenient, dangerous or disfiguring in their application. Treatment with magnesium sulphate, for instance, consists in giving enough of the salt to loosen the bowels for six weeks. After this disagreeable experience the results, as far as the verrucae are concerned, are uncertain.

As Sir Norman Walker said, the ways of warts are mysterious. Several years ago we struggled unsuccessfully with a case that cleared up in a short time in the hands of a colleague on a course of Asiatic pills (black pepper and arsenic). An amusing instance of a like nature was related by Tenneson. A young girl came to his clinic in the St. Louis Hospital with her hands covered with warts. He prescribed magnesium oxide, three teaspoonfuls a day, with no other treatment, and at the same time he told the students that the treatment would certainly do no good. Two weeks afterward the patient returned to thank him, all of the warts having disappeared.[2] Possibly Bloch might refer such a cure to suggestion. If such be the case it may also be that the cures reported from subcutaneous injections of milk, usually ascribed to protein shock, are also really cures from suggestion.

Sometimes also warts may disappear under the administration of yellow mercurous iodide. There cannot be any objection to giving small

2. Tenneson, H.: Traité clinique de dermatologie, Paris, O. Doin, 1893, p. 294. (This book evidently was written and not manufactured, and although it is now old and out of date, it still affords pleasant and instructive reading.)

doses of arsenic or yellow mercurous iodide, or in adopting any other measures, dietetic or otherwise, for relieving a too fatty or sweaty skin on which warts grow luxuriantly. For instance, an old and delightfully cultured friend, W. A. Hardaway, of St. Louis, used always to look for flat feet in a patient with warts of the sole, as that condition is so often associated both with hyperhidrosis and verrucae. And we have reason to believe that this connection between deformities of the feet, hyperhidrosis and warts is not infrequently found by orthopedists. Seborrhea, hyperhidrosis, overweight, overnutrition and a susceptibility to the infective agent producing warts are undoubtedly linked. Not long before the present writing we had a case showing the futility of narrowly restricted local measures in treating these lesions. A florid, overnourished man had a wart below his chin excised by a surgeon a year before consulting us. It recurred, and under another physician's care it disappeared under radium therapy, but others promptly sprang up about it. He then went to a "needle specialist," under whose care the lesions bloomed abundantly. Under the general treatment already indicated and under dietetic restrictions, the condition seemed definitely to be clearing up when the patient was last observed. The point is that the surgical operation was not indicated, as evulsion and cauterization would have been simpler and better, and that all of the previous treatments were too restricted to control such a widely distributed virus.

It must be admitted, however, that a restricted treatment is sometimes followed by astonishing success. Several years before this writing, a young girl consulted us for numerous warts on the hands. All those on one hand were treated with radium, with the understanding that she should return in a few days to have those on the other hand so treated. She did not return, and on inquiry we learned from her sister that all of the lesions on the untreated hand had disappeared spontaneously. In another refractory case, the verrucae of the hands and face did not clear up until a wart near the anus was treated. In fact, these occult warts give rise to entertaining clinical surprises. Recently we found a small wart just within the corner of the mouth in a man who had recently come under our treatment, but who had long suffered from recurrent lesions. If this had not been found, our work might have been as infructuous as that of our predecessors. These experiences accord with the tradition of "seed warts" and the "mother wart," which has persisted through the ages.

A personal experience of success through local applications is the following. A child had undergone treatment for verruca vulgaris for two years; the treatment was mechanical, including curettings and cauterization. Owing to the nervous condition of the patient and his

having become fearful of pain, the two following prescriptions were given, and they proved entirely successful:

	Gm. or Cc.
1. Phenol	6
Salicylic acid	6
Boric acid	4
Spirit of lavender	4
Alcohol	120

Apply before using the salve, once a day.

	Gm. or Cc.
2. Salicylic acid	4
Wool fat	15
Petrolatum	15

Rub in well after lotion dries, once a day.

This treatment is best used each evening before retiring.

The same method can be used effectively in some cases of flat warts of the scalp largely denuded of hair.

Treatment with roentgen rays may give a dramatically swift result or may fail entirely, but it would be deplorable to cause a consequent telangiectasis or necrosis, and this does occur under the most careful management. On the other hand, for verrucae under the thick skin of the soles or palms or for verrucae under the nails, radium therapy is by far the treatment of choice.

Sometimes warts of the palmar surface may be readily evulsed, as previously mentioned, and as this treatment is prompt, thorough and practically free from danger, it is the treatment of choice. If, however, the warts are thickly aggregated, forming a large, rough patch, as is sometimes seen on the thumb, if they are deep-seated with massive corneous development superimposed, as they may occur on the palm, and frequently on the sole, or if they occur as vegetations in the groove around the nail, radium is the treatment to be adopted.

RADIUM THERAPY FOR WARTS OF THE SOLES, PALMS AND NAILFOLDS

In the treatment of the deep warts of the palms, soles and nail sulcus by radium, we employ a powerful instrument. When we first obtained radium, several years before this writing, we sought the advice of Dr. Robert Abbe of New York as to its form. He advised us to get a plaque the size of a ten-cent piece which contained all the radium salt that the manufacturers could get into it in one layer, and before using it to apply it for ten minutes unscreened to the skin of the forearm of one of us and observe the effect. It caused a burn, the scar of which is still plainly visible after fifteen years. We were convinced of its strength beyond anything that the Bureau of Standards could tell us.

We first mark the outline of the wart carefully with ink, and then place over it a lead shield 1 mm. thick with a hole in it exposing only the outlined top of the wart. This shield is carefully fastened in place with adhesive plaster. We then fasten the aforementioned strong

radium plaque unscreened over the opening and keep it there for from one-half to one and a quarter hours, according to the apparent depth of the wart. Warts of the sole require one and one-quarter hours' exposure, as a rule. Over the normal skin this would cause a severe burn, but over a wart the conditions are different. As already related, these warts are deep downgrowths of epithelial masses composed of cells of the external integument, one of the normal physical properties of which is to furnish a screen for actinic rays. This thick screen is fully equivalent to a thick screen of lead, and even after a prolonged application of a powerful radium plaque no injury is done to the underlying tissues. After about a week or ten days the wart becomes inflamed, and then the reaction slowly subsides. It is rarely necessary to repeat the procedure, which, however, should not be done within from six to eight weeks.

Verrucae or papillomas of any region are all true acanthomas and are all probably due to the same virus. They furnish, however, an excellent example of the inadequacy of a strictly etiologic classification for clinical working conditions. Many men have dreamed of finding one cause for each disease and of applying one remedy. In the first place it is rare to find a disease with only one cause, and even when this cause is found the disease in its different situations and circumstances must be treated by measures varying to suit the varying conditions.

CUTANEOUS CALCINOSIS

REPORT OF A CASE *

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The term calcinosis has been used in dermatologic literature, especially in Germany, to designate the abnormal presence of calcium tumors and plaques in the skin and in the subcutaneous tissue. There is a fairly extensive literature dealing with this disease, and two papers written in recent years, one by Weidman and Schaffer [1] and the other by Durham,[2] treat the subject thoroughly and contain a good bibliography. Before reporting our case, we wish to give a summary of the important observations in the literature.

CLINICAL PICTURE

The clinical picture of this disease, which is described repeatedly, is as follows: Tumors or plaques, varying in size from that of a pea to that of a walnut, of hard or soft consistency appear under or in the skin, most frequently on the fingers, hands, wrists, elbows and knees, often following the course of the tendons. The skin above these tumors becomes red, the tumor adheres to the skin, which it perforates, and a creamy mass, often containing small granules, is discharged. The tumors then decrease in size or disappear altogether. New lesions may appear in crops. In a few cases deposits of calcium appear in the form of elevated yellow ridges, especially over the knees and elbows.

CLASSIFICATION

There are two forms of calcinosis: the local and the general. The former designates calcification in tumors such as epithelioma, atheroma,

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1. Weidman, F. D., and Schaffer, L. W.: Calcification of Skin, Including Epiderm, in Connection with Extensive Bone Resorption, Arch. Dermat. & Syph. **14**:503 (Nov.) 1926.

2. Durham, Robert H.: Scleroderma and Calcinosis, Arch. Int. Med. **42**:267 (Oct.) 1928.

dermoid cyst or in lesions such as pseudoxanthoma elasticum. This is purely a local disease, not dependent on any general disturbance in the body. The general form of calcinosis may be due to the presence of an excessive amount of calcium in the blood which is brought about by destruction of bone through osteomyelitis, caries or lymphatic leukemia. This form is called "metastatic calcinosis." Here belong, among others, the cases reported by Jadassohn,[3] Kerl,[4] Wells,[5] Schultze,[6] Thomas [7] and Weidman and Schaffer.[1] Another form of general calcinosis is the "metabolic calcinosis," which is more frequently observed, and which is due to some imperfectly understood disturbance of the calcium metabolism. In this form there is no destruction of bone.

Different names have been used for this disease. Milian [8] described such cases under the title "hygromes calcifies et granulomes calcaires souscutanees" because of the location of the calcium deposits in serous bursae on the knees and elbows, and because on histologic examination he found epithelioid cells and giant cells. Schmidt,[9] who found much similarity between calcinosis and urate deposits in the skin, used the name "chalky gout"; other names used are "phosphate and carbonate concretions" and "calcium metastases."

CHEMICAL AND HISTOLOGIC EXAMINATION OF THE TUMORS

Chemical Examination.—The chemical examination of the creamy material discharged by these tumors usually proved the presence of a great amount of calcium phosphate and a small amount or a trace of calcium carbonate. No urates were found. Marotte [10] was the first to examine the creamy material chemically, and he found calcium

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3. Jadassohn, J.: Kalkmetastasen der Haut, Arch. f. Dermat. u. Syph. **100**: 317, 1910.

4. Kerl, W.: Beiträge zur Kenntnis der Verkalkungen der Haut, Arch. f. Dermat. u. Syph. **126**:172, 1919.

5. Wells, H. G.: Metastatic Calcification, Arch. Int. Med. **15**:574 (April) 1915.

6. Schultze, F.: Skelettveraenderungen als Ursache von Verkalkungen, Mitt. a. d. Grenzgeb. d. Med. u. Chir. **36**:243, 1923.

7. Thomas, W. S., in discussion on Weidman, F. D., and Schaffer, L. W.: Calcification of Skin, Including Epiderm, in Connection with Extensive Bone Resorption, Arch. Dermat. & Syph. **14**:503 (Nov.) 1926.

8. Milian: Presse méd. **8**:414 (Dec.) 1900.

9. Schmidt, M. B.: Kallmetastase und Kalkgicut, Deutsche med. Wchnschr. **2**:59, 1913.

10. Marotte, quoted by Teissier: Du diabète phosphatique, Thèse de Paris, 1877.

phosphate almost exclusively. Following are the observations of others compiled by Gilbert and Pollet:[11]

	Calcium Phosphate	Calcium Carbonate
Milian and Neveu	Predominant	Some
Renon and Dufour	19.29%	3.44%
Jeanne and Profichet	40.60%	4.08%
Bayle	55.50%	15.00%
Gilbert and Pollet	63.00%	7.00%
Weil and Weissenbach	90.00%	10.00%
Cramer	Calcium phosphate	Trace

Several investigators, however, found a predominance of calcium carbonate, and some found calcium carbonate exclusively (Weber,[12] Lewandowsky,[13] Dietschy,[14] Stradiotti,[14] and Thibierge and Weissenbach[15]).

Histologic Examination.—The histologic examination of the calcium plaques in Jadassohn's case [3] revealed calcification of the cutis, particularly of the upper and lower portions. The calcium was deposited in spaces between the collagenous bundles, not in the lymph vessels. No thick, fibrous capsule surrounded the calcium mass. There was calcification of the elastic fibers, and within the calcium mass elastic fibers were found. Jadassohn expressed the belief that the process begins by inbibition of the elastic fibers by calcium, followed by swelling and fragmentation of elastic fibers and of the collagenous substance; later inflammatory changes take place and cavities filled with calcareous matter and remnants of elastic tissue are formed.

Wildbolz [16] also found calcification of the elastic fibers, but he believed that degeneration of those fibers first takes place. The calcium was deposited between the collagenous fibers, and in irregular spaces was lined with endothelium, but no large cavity showed endothelial lining.

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11. Gilbert and Pollet: Concrétions calcaires souscutanées, Paris méd. **15:** 345 (Oct. 31) 1925.

12. Weber: Cor.-Bl. f. schweiz. Aerzte **8:**623, 1878.

13. Lewandowsky, F.: Ueber subcutane und periartikulaere Verkalkungen, Virchows Arch. f. path. Anat. **181:**179, 1905.

14. Dietschy: Ztschr. f. klin. Med. **64:**377, 1907. Stradiotti: Sopra un caso di calcificationi multiple del cellulare sottocutaneo di origine syphilitica, Policlinico **17:**255, 1910.

15. Thibierge and Weissenbach: Concrétions calcaires souscutanées et sclérodermie, Ann. de dermat. et syph. **2:**129, 1911.

16. Wildbolz, H.: Ueber Bildung von phosphorsauren und kohlensauren Konkrementen in Haut und Unterhautgewebe, Arch. f. Dermat. u. Syph. **70:**435, 1904.

Granulation tissue and giant cells were also found. There was a thick fibrous capsule around the calcium mass.

Tilp [17] and Milian [8] found foreign body giant cells near the calcium masses and calcification of fat and connective tissue. Lewandowsky [13] also found granulation tissue and giant cells. In Tisdall and Erb's [18] case there was calcification in degenerated connective tissue. The case reported by Loewenbach [19] showed calcium deposits in the elastic bundles, and that reported by Kraus,[20] tuberculous cellular infiltration, caseation and calcification of the subcutaneous tissue. Guhrauer [21] found calcium deposits in cavities without an inflammatory zone around them.

In Weidman and Schaffer's case there were intercellular and intracellular deposits of calcium salts in the epidermis. In the corium calcium was found in the collagen bundles, within the lumina of the blood vessels, in the lining of the endothelial cells of the capillaries, veins and arteries, in the muscular wall of the arteries, in the nerve trunks and pacinian corpuscles and in the sweat ducts and coil glands. The sebaceous glands were not affected. Tubercles were found in almost every section from every part and all levels of the affected skin. The calcification was peculiarly associated with an infiltration of fat. Corresponding with the theory of Klotz,[22] Weidman and Schaffer interpreted their case as one of preliminary fatty metamorphosis of tissue followed by final calcification. The fatty phase constituted here, according to these authors, the so-called "Kalkfaenger" (lime catcher) of the Germans. The elastic tissue, which is known to have a strong affinity for calcium and the subcutaneous fat tissue, was not affected in their case.

BLOOD CHEMISTRY

In most cases the chemical examination of the blood showed a normal amount of calcium. In the metastatic cases in which an extensive resorption of bone takes place, an excessive amount of calcium in the blood is to be expected. In Weidman's case a normal amount of calcium but a high cholesterol content of the blood was found. However, the specimen here consisted of the hand of a man with arteriosclerosis which

17. Tilp, A.: Demonstration eines Falles von ausgebreiteter Calcinosis, Verhandl. d. deutsch. path. Gesellsch. **7**:277, 1910.

18. Tisdall, F. F., and Erb, I. H.: Report of Two Cases with Unusual Calcareous Deposits, Am. J. Dis. Child. **27**:28 (April) 1924.

19. Loewenbach, quoted by Lesseliers, E.: Bull. Soc. de méd. de Gand. **75**:7, 1908.

20. Kraus, quoted by Lesseliers (footnote 19).

21. Guhrauer, H.: Dermat. Wchnschr. **80**:113, 1925.

22. Klotz, O.: Studies upon Calcareous Degeneration, J. Exper. Med. **7**:633, 1905.

was amputated one year previously because of osteomyelitis. Had the examination of the blood taken place at that time, it is possible that the blood calcium would have shown an increase.

ASSOCIATION OF CALCINOSIS WITH OTHER DISEASES

It is important to pay attention to the diseases with which calcinosis has been reported to be associated, as they may help in solving the etiology. The patients of Loewenbach,[19] Kraus [20] and Guhrauer [21] had tuberculosis of the lungs. Many patients gave a history of rheumatic pains and more or less pronounced arthritic disturbances which frequently caused limitation of movement. The cases reported by Cramer,[23] Langmead,[24] Lewandowsky,[18] Tisdall and Erb,[18] Tilp [17] and others belong to this group. In some of the cases there was a history of rheumatism in other members of the family. Of the cases of "metastatic calcinosis," there was destruction of bone by osteomyelitis in those reported by Jadassohn and Weidman and Schaffer, by caries in that reported by Virchow [25] and by lymphatic leukemia in that reported by Kerl. Some patients with calcinosis suffer from chronic nephritis (Hubbard and Wentworth [26]), which is considered by some authors as an important predisposing cause and which we explain later.

A relatively large number of cases are associated with scleroderma. The first cases of this kind were described by the Swiss physician Weber in 1878,[12] who, however, interpreted the calcium deposits as gout. Fourteen cases of calcinosis associated with scleroderma or sclerodactylia were collected by Durham [2] in 1928, and were added to the nine cases reported by Thibierge and Weissenbach [15] in 1911.

Langmead [24] from a study of the literature and through his own observations, was convinced that calcinosis, generalized scleroderma, dermatomyositis and myositis fibrosa are all manifestations of one disease. He expressed the belief that in these four disorders there is an underlying single morbid process which, however, is unknown. According to this author, certain conditions accompany calcinosis too frequently to be merely accidental. Most frequent is the association of calcinosis with scleroderma and sclerodactylia.

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23. Cramer, Alec: Les concrétions calcaires souscutanées, Rev. méd. de la Suisse Rom. **42**:111, 1922.

24. Langmead, F. S.: The Relationship Between Certain Rare Diseases, Arch. Pediat. **40**:112, 1923.

25. Virchow, R.: Arch. f. path. Anat. **8**:103, 1855.

26. Hubbard, R. S., and Wentworth, J. A.: Case of Metastatic Calcification with Chronic Nephritis and Hyperplasia of Parathyroids, Proc. Soc. Exper. Biol. & Med. **18**:307, 1920-1921.

A few cases were found to be associated with some disturbance of the endocrine glands. Thomas reported the presence of metastatic calcification in a boy in whom markedly enlarged parathyroid glands were found at autopsy. Hubbard and Wentworth's patient also had hyperplasia of the parathyroids. Durham reported the presence of colloid adenoma and old scars in the thyroid gland of his patient. Kuznitsky and Melchior [27] reported the association of calcinosis with progressive lipodystrophy. Guhrauer's patient had premature amenorrhea due to dystrophy of the ovaries. Hueper [28] could produce metastatic calcification in the organs of the dog after the injection of parathyroid extract.

AGE; PROGNOSIS; PATHOGENESIS

Age of the Patients.—The age of those afflicted with calcinosis varies from 5 weeks to above 65 years. In the adult cases, women seem to be more affected than men.

Prognosis.—In most of the metastatic cases in which calcinosis is associated with an extensive and serious disease of the bone, such as osteomyelitis, caries or lymphatic leukemia, or in which the internal organs participate in the calcinosis, the prognosis is bad. To this class belong the cases of Jadassohn and Kerl, and the case of Tisdall and Erb. In most cases, however, the prognosis seems to be good.

Pathogenesis.—The pathogenesis of calcinosis is fairly well understood in the metastatic form in which the destruction of bone throws out into the blood an excessive amount of calcium salts which are deposited in the skin in certain locations. The choice of these places is apparently dependent on the vitality of the cells of this region. The cells and the tissues which are lessened in vitality are readily calcified. This seems to be true also for the other forms of calcinosis in which the etiologic factors are not so easily understood. In Weidman's case there was impairment of vitality in the cells of the skin of the hand by previous fatty infiltration in consequence of a fatty dyscrasia. The fat was partly replaced by calcium salts which were delivered by resorption of the bones of the hand. This case and the cases of Lecène and Montougnet [29] and Lee and Adair [30] support the theory of Klotz, that

27. Kuznitsky, E., and Melchior, E.: Subcutaneous Lymphsackbildung und Kalkablagerungen bei universallem Fettschwund, Arch. f. Dermat. u. Syph. **123**: 133, 1916.

28. Hueper, W.: Metastatic Calcification in the Organs of the Dog After Injection of Parathyroid Extract, Arch. Path. **3**:14 (Jan.) 1927.

29. Lecène, P., and Montougnet, P.: La cystostéatonécrose ou saponification intracellulaire du tissu cellulo-adipeux souscutané, Ann. d'anat. path. **2**:193, 1925.

30. Lee, B. J., and Adair, F. E.: Traumatic Fat Necrosis of the Female Breast and Its Differentiation from Carcinoma, Ann. Surg. **80**:670, 1924.

fatty metamorphosis of tissue precedes the final calcification "which comes about through a series of intermediate changes in which soaps figure."

Thibierge and Weissenbach maintained that in those cases of calcinosis which are combined with sclerosis of the skin and subcutaneous tissue, and in those cases which are associated with Raynaud's phenomena,[21] the deposition of calcium salts constitutes a final stage; first there is formation of fibrous tissue, then hyaline or colloid degeneration of the skin followed by calcification.

Cases of calcinosis associated with nephritis are caused, according to Schmidt [9] and others, by physicochemical changes in the blood, not by retention of calcium through kidney insufficiency, because the largest part of the calcium is eliminated through the intestines. The calcium in the plasma of the blood is in adsorption with the colloid proteins which prevent the precipitation of the calcium. Through nephritis a change is produced in the physicochemical balance and in the conditions of the solubility of the blood calcium, and there results deposition of calcium salts in physiologically predisposed tissue. In this connection the opinion of Rable [31] is interesting. He stated that through a diet principally vegetarian, there is a decrease in the hydrogen ion concentration and in the solubility of calcium in the blood, by which great saturation of calcium and its precipitation occurs in predisposed tissues. According to Jadassohn, however, nephritis is only a predisposing factor. Calcium metastases, like calcification in general, occur only in tissue that is decreased in vitality.

REPORT OF CASE

E. Sch., a boy, aged 14, came to the New York University skin clinic on July 5, 1929, with the following disease of the skin: On the dorsum of the right index finger, corresponding to the course of the tendon, there was a cordlike protuberance connected with the skin, showing a hard tumor, the size of a pea, in one place, while the rest of the cord was cystic (fig. 1). A tumor, the size of a walnut, situated in the prolongation of the cord over the metacarpophalangeal joint, was of similar cystic consistency, but nodules on the radial side of this joint were hard. A hard cordlike swelling in which a few separate very hard nodules could be felt ran up to the wrist and the radial side of the right forearm, the course corresponding to that of the tendon. The right palm and particularly the palmar surface of the fingers showed about ten very hard tumors, varying in size from that of a small pea to that of a hazelnut, all except one attached to the skin, which was somewhat red and eroded (fig. 2). The skin over one nodule was freely movable. The palmar surface of the left ring finger presented five tumors of hard consistency, the size of a large pea, around the first phalangeal joint. One was situated near the metacarpophalangeal joint of the left thumb. Several similar tumors were located

31. Rable, quoted by Schmidt, M. B.: Deutsche med. Wchnschr. **2**:59, 1913.

Fig. 1.—Cordlike protuberance on the dorsum of the right index finger.

Fig. 2.—Right hand, showing calcium tumors, most of which are attached to the skin.

Fig. 3.—Calcium tumors on the left elbow.

Fig. 4.—Large calcium tumor over the patella.

on the left wrist and the ulnar side of the palm. Over the left elbow there were two tumors the size of a large pea, and laterally one tumor, the size of a walnut, the tip and the middle portion of which were soft and yellowish while the base of the tumor felt hard (fig. 3). On the right arm and in the anterior axillary region there were a few subcutaneous nodules, the size of an almond, over which the skin could be moved. Similar tumors were located on the extensor surfaces of the right thigh. On the right knee over the patella there was one large tumor similar to the one over the olecranon and several small ones near it (fig. 4). There were several lesions, the size of a hazelnut, on the outer side of this knee and one lesion, the size of a pea, on the inner side of the left knee. A few small subcutaneous tumors were located on the anterior and the posterior surface of the left leg. On the right buttock there were a few hard plaques, the size of a nickel and larger, attached to the skin. Behind the right ear there was a tumor, the size of a hazelnut, covered with red telangiectatic skin and of the consistency of a well filled cyst.

There were a few slightly depressed scars on the left forearm and on both arms (fig. 3), which, according to the patient, were due to the removal of tumors by a physician a few years previously. A scar on the right thigh was the result of a tumor, which opened spontaneously and discharged a whitish, creamy material.

On general inspection of the patient, besides the tumors mentioned, the following conspicuous abnormalities were seen: a prominent jaw and nose, a senile expression of the face, a markedly funnel-shaped chest at the lower sternum, the female type of growth of pubic hair, small testes, thin muscles of the upper extremities and a large lipoma, the size of a fist, underneath the left scapula.

There was distinct limitation in the movement of the hands; the patient could extend his hands, but could not flex them.

Percussion and auscultation did not reveal any abnormality in the heart and the lungs.

His intelligence was normal. In school he attended class 5B, but he was behind only because he had been in the hospital and had attended clinics frequently.

History.—The patient was the fourth child of healthy parents, the other members of the immediate family being normal. He was perfectly well until the age of 7; then he suffered from a sore throat, which was followed by nephritis with generalized edema. Because of this, he was confined to bed for from seven to eight months. While in bed, he developed clubfoot, which was corrected by operation in Bellevue Hospital two years before examination.

The tumors present at the time of examination started gradually three years previously, first on the hands and then on the elbows, knees and lower extremities. The tumor behind the right ear developed two years before examination. From time to time some of the tumors opened, discharging a creamy material, after which they became smaller or disappeared altogether leaving a depressed scar. While under our observation, the whitish tip of the large tumor on the left elbow opened spontaneously, and yellowish-white matter was discharged. The tumor decreased markedly in size, but a hard plaque was still palpable. Later, one of the tumors situated on the palmar surface of the left ring finger around the first phalangeal joint became soft and white. We punctured this tumor and produced creamy material not only when pressing it, but also when pressing any of the five tumors situated at that location. The tumors apparently communicated with one another.

Fig. 5.—Low power photomicrograph of a calcium tumor.

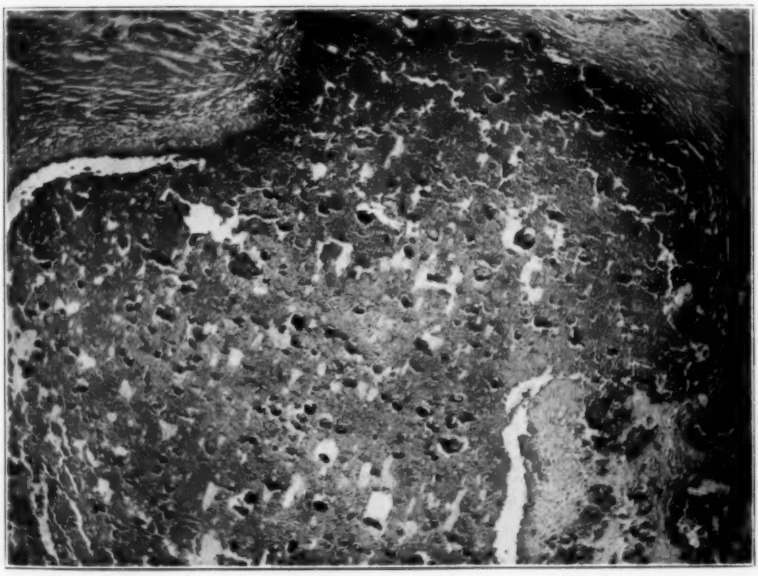

Fig. 6.—High power photomicrograph of a calcium tumor.

Fig. 7.—Same tumor as in figure 5, stained for calcium phosphate.

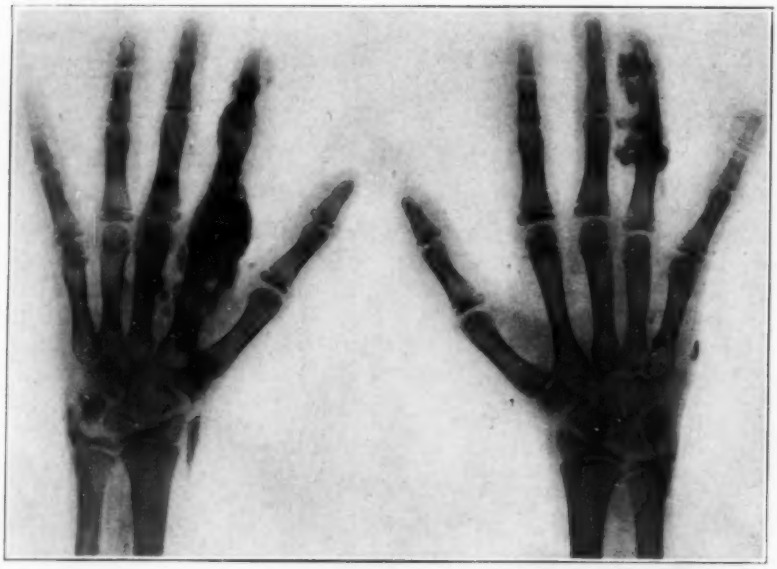

Fig. 8.—Calcium deposits in the soft tissues of the left and right hand. A calcified tendon is seen in the right forearm.

Fig. 9.—Roentgenogram of the right and the left forearm.

For histologic examination we first removed the tumor near the metacarpophalangeal joint of the left thumb and succeeded in removing it intact with the skin above. Strangely enough the tumor, which felt stony hard before removal, could be cut easily after being in formaldehyde for forty-eight hours. We did not succeed, however, in removing intact the tumors from the right little finger and wrist, as they easily broke down under the operation and produced the characteristic creamy matter.

Histologic Examination.—On low power examination, we found the epidermis wavy and surmounted by a thick scale. The rete was thickened. The pegs were irregular, many were broadened with the tips flattened, many others were fused and some were clubbed. The corium was stained rather lightly and the prominent feature was the presence of three large, completely encapsulated cavities separated

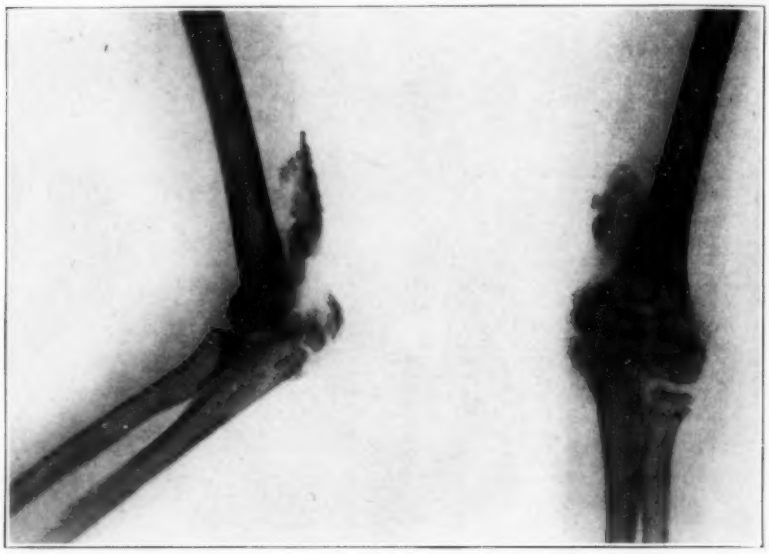

Fig. 10.—Calcium deposits in the soft tissues and bursa of the left elbow.

by dense trabeculae and containing material which in some places was homogeneous and in others broken up into small beadlike bodies (fig. 5).

On high power microscopic examination (fig. 6), we found as the main features of the epidermis hyperkeratosis, acanthosis and intercellular and intracellular edema. The corium showed a marked swelling of the individual collagen fibers and a peculiar clumping of the bundles, except for the fibrous wall of the cavities in which the collagen fibers were swollen and maintained a definite parallel arrangement. The beadlike bodies appeared as large, degenerated cells or as granular deposits. A few smaller cavity formations were noted at the periphery of the larger ones, denoting an extension of the process. Blood vessels near those cavities were dilated and showed moderate infiltration of round cells and fibroblasts around them.

The sections were then stained by silver nitrate solution according to the method of Huebschman, which was described and used by Jadassohn and which is supposed to be a stain for calcium phosphate. The granular material in the

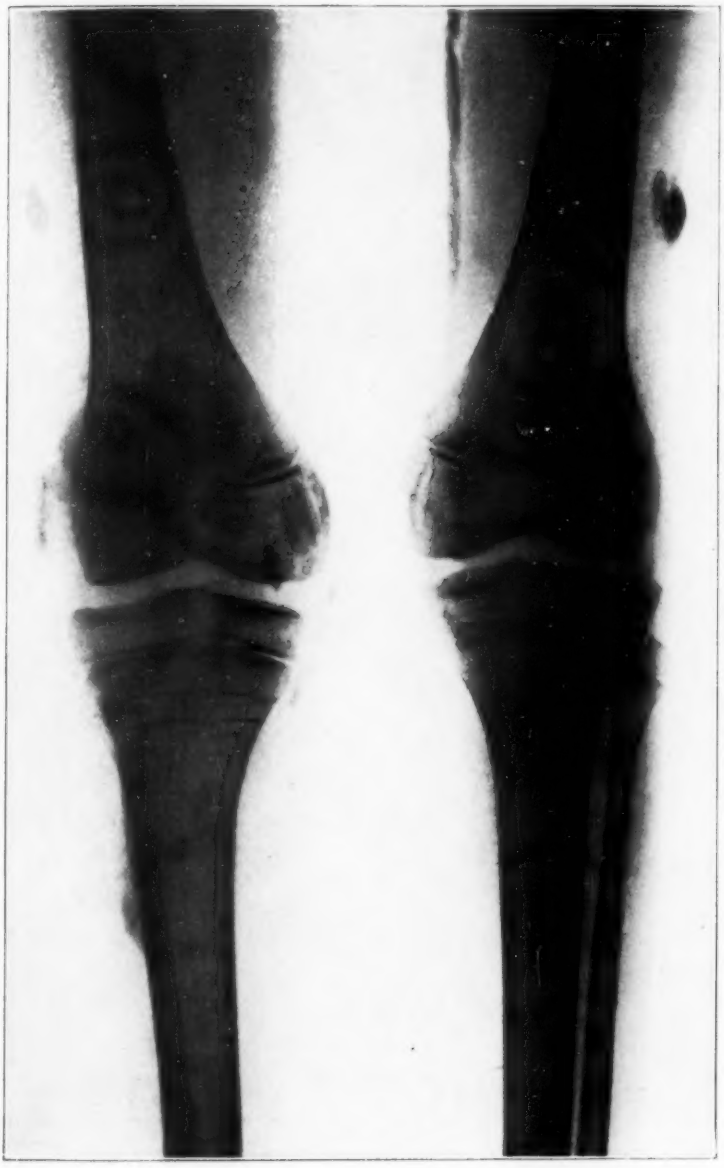

Fig. 11.—Right and left knee joints.

Fig. 12.—Calcium deposits over the patella and the right popliteal space.

Fig. 13.—Calcium deposits in the soft tissues of the thighs.

cavities was stained black by this method (fig. 7). Weigert's stain did not disclose any abnormality in the elastic fibers found in the cavities. Sudan IV stain did not show any infiltration of fat in the tissues.

Chemical Examination.—The whitish matter of some of the tumors was examined chemically by Dr. Gettler of Bellevue Hospital and was reported as containing an "enormous amount of calcium." Two years previously, while the patient was in Bellevue Hospital for an operation, the creamy matter of one of these tumors was also examined chemically, and the following report was received:

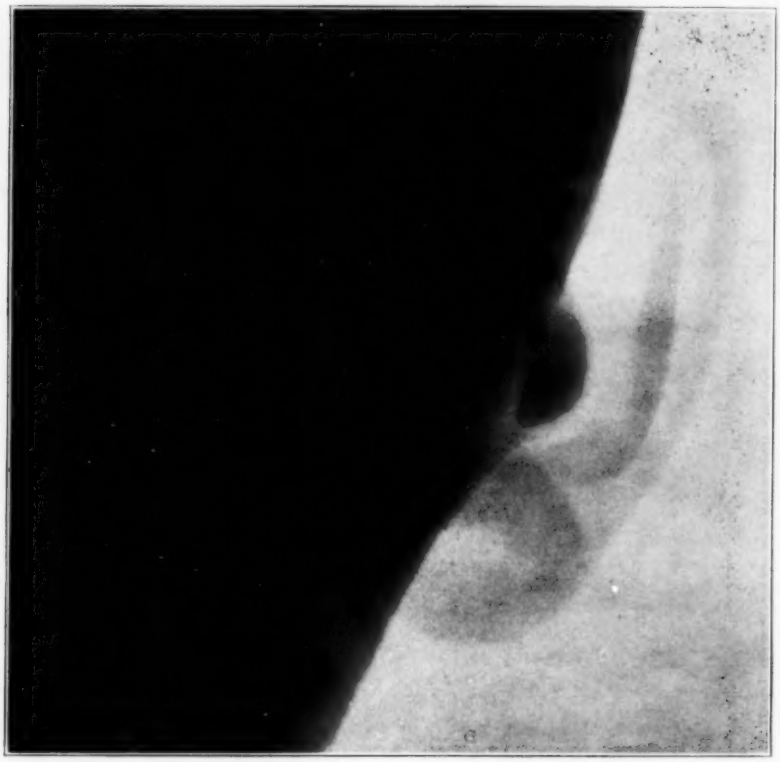

Fig. 14.—Calcium tumor behind the right ear.

There was a small amount of organic matter; a large amount of tricalcium phosphate; a trace of chlorides and a small amount of carbonates.

The blood count and the differential count showed: erythrocytes, 3,650,000; hemoglobin, 90 per cent; leukocytes, 12,300; polymorphonuclears, 37 per cent; lymphocytes, 59 per cent; monocytes and transitionals, 2 per cent; eosinophils, 1 per cent, and basophils, 1 per cent.

The chemical examination of the blood showed: sugar, 106; calcium, 8.4, and cholesterol, 202 mg. per hundred cubic centimeters.

A complete chemical analysis of the blood was done two years previously in Bellevue Hospital and was found normal except for a somewhat high phosphate

content (6.35). Urinalysis did not show any abnormalities, and the Wassermann reaction of the blood was negative.

Roentgen Examination.—The roentgen report made by Dr. Boris Ouspensky is as follows: The epiphyses of the bones of both elbows showed some retardation of ossification. There were a few dense transverse lines in the region of the metaphysis of each radius. These lines indicated faulty ossification when the epiphysis was at those points. There were extensive calcified deposits in the soft tissues of each hand, more marked in the tendon sheath of the right index finger extending up to the forearm and in the fourth finger of the left hand (figs. 8 and 9).

Fig. 15.—Normal sella turcica and prognathism.

There were extensive deposits of lime salt about the left elbow joint within the bursae and the soft tissues (fig. 10).

There were extensive deposits of calcium about both knee joints (figs. 11 and 12). On the right side this was particularly noticeable about the patella. On both sides the calcified material could be made out as far as the middle third of the thigh (fig. 13).

In the soft tissue of the right mastoid region there was a calcium deposit about 1 cm. in diameter (fig. 14). The sella turcica was normal in size, shape and position and had regular outlines. The baseline of the skull was somewhat straightened. The sutures showed a more pronounced ossification than is usual at this

age. The accessory nasal sinuses appeared rather large. The jaw bones were prominent indicating prognathism (fig. 15).

Examination of Chest (Fluoroscopy and Roentgenography).—Examination showed a funnel-shaped chest. Movement of the diaphragm on both sides was normal. The apexes of the lungs were clearing up normally when the patient coughed. The heart showed mitral configuration with some enlargement of the left auricle. The hili of both lungs were enlarged, and a number of calcified

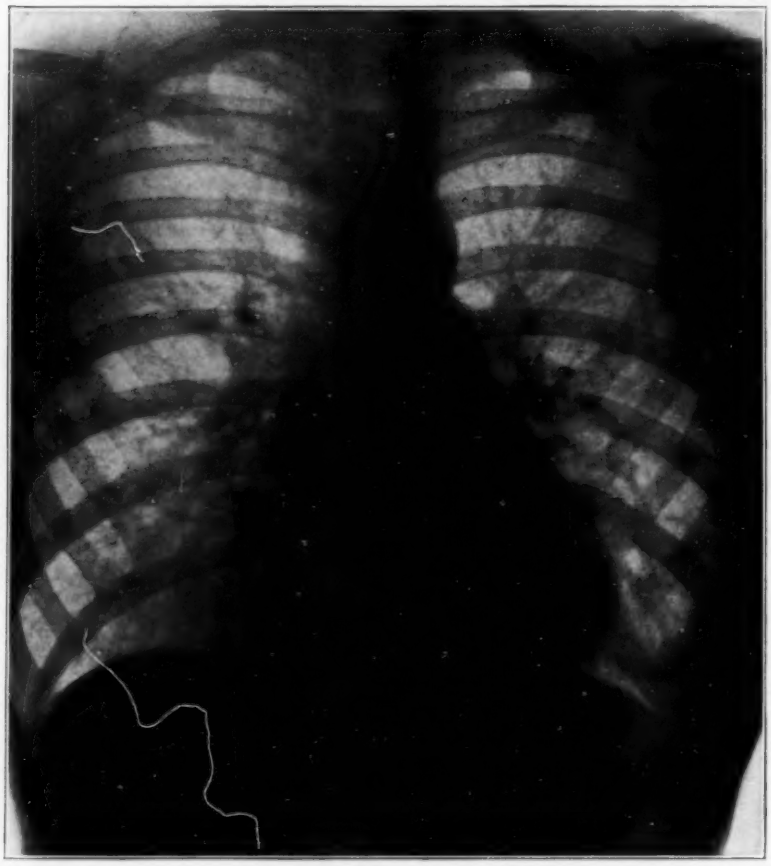

Fig. 16.—Infiltration in the lungs.

glands were seen. There were areas of infiltration in the lower lobe of each lung (fig. 16).

SUMMARY AND CONCLUSIONS

We have reviewed a great part of the literature on calcinosis. We have described a case of calcinosis in a boy 14 years of age, with multiple tumors in the skin and subcutaneous tissue of the hands, elbows and knees. He gave a history of preceding infection of the

throat and severe nephritis and showed signs of some endocrine disturbance.

This case belongs to the group of metabolic calcinosis. It is conceivable that the preceding nephritis for which the patient was confined to bed for many months had disturbed the physicochemical balance and the solubility of the calcium in the blood, and so produced the calcium deposits in the skin. What part the endocrine disturbance, signs of which the patient undoubtedly showed, played in the causation of the calcium tumors is impossible for us to say.

A DISCOLORATION OF THE SKIN AND MUCOUS MEMBRANES RESEMBLING ARGYRIA, FOLLOWING THE USE OF BISMUTH AND SILVER ARSPHENAMINE

REPORT OF THREE CASES WITH MICROSCOPIC EXAMINATION, INCLUDING SPECTROGRAPHIC AND CHEMICAL ANALYSES OF THE TISSUES *

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NEW YORK

The increase in the use of silver arsphenamine in the treatment for syphilis, not only in late cerebrospinal lesions, but in the earlier manifestations, shows that it is recognized by numerous syphilologists as a potent remedy. Some clinicians have avoided this preparation because of the possibility that it might cause argyria.

In an extended use of silver arsphenamine in the treatment for both early and late syphilis during the past eight years, I have been greatly impressed with the results obtained from the use of this drug. It has shown excellent compatibility with the body fluids, as manifested by its low toxicity and the absence of unfavorable reactions following its use, especially when given in intensive dosage and according to the methods advocated by Pollitzer,[1] Kolmer [2] and others in the treatment for early syphilis. Habermann,[3] Sioli [4] and Mucha [5] stated that argyria might occur after 15 Gm. of silver arsphenamine had been administered, but

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* Read before the Section on Dermatology and Syphilology at the Eighty-First Annual Session of the American Medical Association, Detroit, June 27, 1930.

1. Pollitzer, S.: The Principles of the Treatment of Syphilis, J. Cutan. Dis. **34**:633 (Sept.) 1916.

2. Kolmer, John A.: Principles and Practice of Chemotherapy, Philadelphia, W. B. Saunders Company, 1926, p. 953.

3. Habermann, R.: Ueber Argyria cutis nach Silbersalvarsan und den Wert der Leuchtbildmethode E. Hoffmans für ihren Nachweis, Dermat. Ztschr. **40**:65 (Jan.) 1924.

4. Sioli, F., quoted by Habermann: Congress of the German Dermatological Society, Munich, May 20-24, 1923.

5. Mucha, quoted by Habermann: Congress of the German Dermatological Society, Munich, May 20-24, 1923.

that this condition was not to be feared before this amount had been injected. These observers also stated that susceptibility to the effects of silver must exist before this condition can develop.

Myers and Corbitt [6] were of the opinion that argyria from silver arsphenamine is a very remote possibility, and mentioned that the cases reported by Habermann [3] and Kogoj [7] were not definitely proved, as they were complicated by arsenical melanosis and gonorrhea. In reporting his case, Habermann [3] made no mention of any complicating therapy. In Kogoj's [7] case, there was associated melanosis and an organic silver preparation had been used on tampons for the gonorrhea. Many of my patients during the past eight years have received up to 12 Gm. of silver arsphenamine either alone or in combination with mercury or bismuth, and no discoloration of the skin has taken place.

The patients in the cases herewith reported were not aware of this discoloration, but when they were observed under subdued or artificial light one gained an immediate impression that the condition was probably argyria. This discoloration is first discernible on the mucous membrane of the oral cavity, and it is evidenced by a bluish-black, streaky or mottled pigmentation. As the process extends, this pigmentation gradually becomes noticeable on the skin, presenting a dirty grayish discoloration, more pronounced on the cheeks, nasolabial folds, the chin and the sides of the neck.

During the early part of November, 1929, I requested Dr. C. N. Myers [6] of the laboratory that distributes silver arsphenamine to see these patients, and at that time he expressed the opinion that the discoloration was most probably due to bismuth; he said that he had seen a similar condition at another clinic in a nearby city.

The clinical picture of argyria is fairly definite and the discoloration produced is permanent; on the other hand, the discoloration due to bismuth, while closely resembling that caused by silver, particularly on the mucous membranes, is transitory and disappears in from three to six months after the drug has been discontinued (Muller,[8] Dietel,[9] Rosen-

6. Myers, C. N., and Corbitt, H. B.: Retention and Elimination of Silver with Special Reference to Silver Salvarsan and Silver Therapy, Am. J. Syph. **8**:4 (Oct.) 1924. Myers, C. N.: Argyria and Its Relation to Silver Therapy, Am. J. Syph. **7**:1 (Jan.) 1923; Silver Salvarsan, Qualitative and Quantitative Studies, ibid. **6**:1 (Jan.) 1922. Hooper, C. W., and Myers, C. N.: Histopathologic and Blood Studies with Silver Salvarsan, J. Lab. & Clin. Med. **10**:3 (Dec.) 1924.

7. Kogoj, F.: Argyrie und Arsenmelanose der Haut und Schleimhaute nach Silver und Neosalvarsan, Acta dermat.-venereol. **4**:95 (March) 1923.

8. Muller, H.; Blass, and Kratzeisen: Experimentelles mikroskopisches und klinisches zur Wismuthbehandlung bei Syphilis (Nadison Kalle), München. med. Wchnschr. **70**:625, 1923.

9. Dietel, quoted by Juliusberg, Fritz: Handbuch der Haut und Geschlechtskrankheiten: Syphilis Therapie, Berlin, Julius Springer, 1928, vol. 18, p. 442.

berg and Perdelwitz [10] and Lohe and Rosenfeld [11]). However, since these patients had received silver arsphenamine as well as bismuth over long periods of time, and although I was fairly certain that the discoloration was due to silver, there was no definite proof as to the cause. The intracutaneous method of determining the presence of silver in the skin and removing the discoloration, as suggested by Stillians and Lawless,[12] was tried in all three cases, but with negative results.

REPORT OF CASES

CASE 1.—*History.*—A. W., aged 23, a housewife, born in Austria, who had been in this country for six years, first came to the Lenox Hill Hospital Dispensary on Jan. 15, 1925. She complained of a swelling on the right side of the neck. Examination showed a large gumma involving the right sternocleidomastoid muscle. The Wassermann test of the blood gave a reaction of 4 plus with both cholesterolized and alcoholic antigens. The patient also presented the following stigmas of congenital syphilis: high palate, frontal bossae and saddle nose. The diagnosis was late congenital syphilis, gumma of the sternocleidomastoid muscle and secondary anemia.

From January 15 to October 17, she received two courses of treatment consisting of ten injections of arsphenamine totaling 4 Gm., eight intramuscular injections of salicylate of mercury of 1 grain (0.065 Gm.) each, and sixteen intramuscular injections of a bismuth iodide preparation (x-iodo-bismuth), totaling 5.44 Gm. or 1.28 Gm. of metallic bismuth. The swelling gradually improved, and she disappeared from observation for a period of five and a half months. She reappeared on March 25, 1926, suffering from interstitial keratitis that was very resistant to treatment. She received two courses of treatment from March 25 to December 21, consisting of twelve injections of silver arsphenamine, totaling 2.4 Gm., and twenty-seven injections of the bismuth iodide preparation, totaling 4.59 Gm., or 2.16 Gm. of metallic bismuth. She was married on Sept. 18, 1927, and had a miscarriage some time in December. From Jan. 31 to Oct. 31, 1928, she received three courses of treatment, consisting of sixteen injections of silver arsphenamine, totaling 3.2 Gm., and twenty-three intramuscular injections of the bismuth iodide preparation, totaling 7.82 Gm., or 1.84 Gm. of metallic bismuth. On July 19, she gave birth to a hydrocephalic infant that died five months later. A bluish-gray discoloration of the patient's skin first attracted attention during August, 1928, and on November 19, a piece of skin was obtained from the back for microscopic examination. This tissue did not reveal any evidence of foreign pigment granules. From Jan. 4 to Aug. 11, 1929, she received two courses of treatment, consisting of ten injections of silver arsphenamine, totaling 2 Gm., and sixteen intramuscular injections of the

10. Rosenberg, Hans; and Perdelwitz, Paul: Die Behandlung der Syphilis mit reinem Wismut (Sorbismol Agfa), Dermat. Wchnschr. **78**:422, 1924.

11. Lohe, H., and Rosenfeld, H.: Untersuchungen über den Wismutsaum und seine Beziehungen zum Gesamtorganismus, Dermat. Ztschr. **50**:409, 1927.

12. Stillians, A. W., and Lawless, T. K.: An Intracutaneous Method of Treating Argyria, Arch. Dermat. & Syph. **17**:153 (Feb.) 1928; The Intradermal Treatment of Argyria, J. A. M. A. **92**:20 (Jan. 5) 1920. Stillians, A. W., in discussion on Wile: Argyrosis, Arch. Dermat. & Syph. **20**:535 (Oct.) 1929.

iodide bismuth preparation, totaling 5.44 Gm. or 1.28 Gm. of metallic bismuth. During March, she again became pregnant, and was referred to the hospital on May 22 for an induced abortion and sterilization. At that time a piece of tissue was obtained from the right labium majus for microscopic examination, and pigment granules were found. The bluish-gray discoloration of the skin was now quite evident, and the general impression was that the patient had argyria.

Physical Examination.—The results of this examination were negative, except for the appearance of the skin. The entire face presented a dirty grayish-blue appearance most marked around the upper and lower eyelids, nasolabial folds, chin and sides of the neck. This discoloration did not disappear on pressure. The mucous membrane of the mouth was deeply pigmented and appeared dark gray, especially on the hard and soft palate and buccal mucosa, and the discoloration was more evident and intense where the mucous membrane came in contact with the amalgam fillings of the teeth. The labial and vaginal mucous membranes were similarly discolored, as were also the sclerae. The Wassermann reaction of the blood had been persistently plus 4 on ten examinations. The spinal fluid was normal in all factors on two examinations. The blood count, and tests for basal metabolism and liver function gave results within normal limits. The blood pressure was 120 systolic and 90 diastolic.

During the forty-six months, the following number of injections had been given: nineteen intravenous injections of arsphenamine, totaling 7.6 Gm., forty-four injections of silver arsphenamine, totaling 8.8 Gm. and containing 1.23 Gm. of silver oxide, and 105 intramuscular injections of an iodide bismuth preparation, totaling 35.7 Gm., or 8.4 Gm. of metallic bismuth.

Case 2.—*History.*—F. B., aged 54, a carpenter, who was born in Austria and who had lived in the United States for twenty-five years, said that he had been treated for gonorrhea nineteen years previously, but that he had not had any other venereal infection. He had received three intravenous injections twelve years previously for his illness.

He first came under observation on Dec. 10, 1925. At that time the Wassermann reaction of the blood was 4 plus. He complained of pains in the legs, ataxia, slight incontinence and backaches. Examination at that time revealed unequal and Argyll Robertson pupils and negative fundi. The Romberg sign was positive; the deep reflexes were absent, and there was paresthesia of both lower legs. The examination of the spinal fluid on December 28, gave the following results: 8 cells negative globulin test and Wassermann reaction, and a colloidal gold curve of 0002332000. The diagnosis was tabes dorsalis. From Dec. 10, 1925, to Nov. 5, 1926, he received twenty-five intravenous injections of arsphenamine, totaling 10 Gm.; twenty-four intravenous injections of mercurosal, totaling 1.15 Gm. of mercury, and twenty-four injections of an iodide bismuth preparation, totaling 8.16 Gm., or 1.92 Gm. of metallic bismuth. The Wassermann reaction of the blood was negative on June 5 and on Sept. 14, 1926. The patient disappeared from observation until May 25, 1927. At that time the Wassermann reaction of the blood was negative, but he complained of pains in the legs and of incontinence. From May 25, to Dec. 29, 1927, he received eight injections of silver arsphenamine, totaling 1.5 Gm., twenty-eight injections of the iodide bismuth preparation, totaling 9.52 Gm., or 2.24 Gm. of metallic bismuth. From March 7 to Dec. 28, 1928, he received two courses of treatment, consisting of twenty-eight injections of an iodide bismuth preparation, totaling 9.52 Gm., or 2.24 Gm. of metallic bismuth; eight injections of tryparsamide; seven injections of silver arsphenamine, totaling

1.4 Gm., and twelve intravenous injections of mercurosal, totaling 0.58 Gm. of mercury. From Jan. 8 to March 28, 1929, he received ten injections of an iodide bismuth preparation, totaling 0.8 Gm. of metallic bismuth. The Wassermann reactions of the blood and spinal fluid were negative on June 4, 1929, and the patient felt considerably improved. He returned on September 5, complaining of pain in the lower part of the legs and weakness. The discoloration of the skin that had been noticed during June was now more pronounced. He again received a course of treatment, consisting of six injections of silver arsphenamine, totaling 1.2 Gm.; eight injections of an iodide bismuth preparation, totaling 0.64 Gm. of metallic bismuth, and twelve intravenous injections of sodium iodide. The examination of the spinal fluid, on November 10, gave entirely negative results. The Wassermann reaction of the blood was also negative. At that time, the patient was free from symptoms.

Physical Examination.—Examination gave normal results except for the appearance of the skin. The entire face was of a color that varied from dirty gray to bluish; it was more evident around the forehead, temples, nasolabial folds, chin and the sides of the neck. This color did not disappear on pressure. The gums were bluish black, and the discoloration extended to the hard and soft palate, and was especially evident on the buccal mucous membrane, where it came in contact with the amalgam fillings of the teeth. On its borders and undersurface, the tongue also presented this slaty blue discoloration. The sclerae did not appear discolored. Examination of the urine gave negative results. The blood count, blood chemistry and the tests for liver function gave results within normal limits.

During the thirty-three months of treatment, this patient had received the following injections: twenty-five intravenous injections of arsphenamine, totaling 10 Gm.; twenty-one intravenous injections of silver arsphenamine, totaling 6.3 Gm. of the drug, containing 0.98 Gm. of silver oxide; thirty-six intravenous injections of mercurosal, totaling 1.73 Gm. of metallic mercury, and ninety-eight intramuscular injections of an iodide bismuth preparation, totaling 33.32 Gm., or 7.84 Gm. of metallic bismuth.

A biopsy was taken on Nov. 4, 1929, from the buccal mucous membrane; also two pieces of tissue measuring 10 by 3 cm. were removed from the upper part of the scapular region for chemical, spectrographic and microscopic examination.

Case 3.—*History.*—M. W., aged 49, married, a housewife, was admitted to the hospital on May 1, 1927, in a comatose condition. The optic disks were hyperemic. The reflexes were considerably increased. The patient gradually regained consciousness, and a marked speech defect was then evident. The Wassermann reaction of the blood was 4 plus, and the observations on the spinal fluid were as follows: 50 cells; globulin, 3 plus; the Wassermann reaction positive, and a colloidal gold curve of 1225554430. During her stay in the hospital, the patient received four injections of mixed typhoid vaccines. She was discharged in an improved condition on June 14, and was referred to the dispensary for further treatment. At that time the diagnosis was meningovascular syphilis and possibly incipient dementia paralytica.

The patient reappeared at the dispensary on November 25, complaining of headache, vertigo and weakness. The examination of the eyes gave normal results. There was a slight speech disorder, but otherwise the neurologic examination gave negative results. The Wassermann reaction of the blood was 4 plus with two antigens, and remained positive on nine subsequent examinations, the last being given on Nov. 26, 1929. The spinal fluid obtained by suboccipital puncture was normal in all factors on eight different examinations, the last being made on

November 26. During the preceding two years she had received thirty-four injections of silver arsphenamine, totaling 10.2 Gm. of the drug, containing 1.42 Gm. of silver oxide, and also forty intramuscular injections of an iodide bismuth preparation, totaling 3.2 Gm. of metallic bismuth.

During the early part of November, 1929, the patient returned to the clinic, and it was then noticed that her skin was discolored.

Physical Examination.—The general physical examination gave essentially normal results, except for the discoloration of the skin. This pigmentation was identical with that observed in the other two patients, except for the buccal mucous membrane, which was more intensely discolored. This patient had an edentulous mouth, with artificial rubber substitutes that may have contributed to this increased discoloration.

A biopsy was obtained from the buccal mucous membrane, and also a piece of tissue from the scapular region for spectrographic analysis and histologic study. The examination of the urine gave negative results. The blood chemistry, blood count and the tests for liver function gave results within normal limits.

The difficulty of definitely determining the etiologic factor was increased in case 1 by my not being able to find any pigment granules on histologic examination of the first biopsy specimen, and in the subsequent six pieces of tissue obtained from all three patients in whom pigment granules were present, the microchemical tests for silver and bismuth did not give the observations usual in such cases. In Habermann's case [3] the pigment granules of silver in the sections of tissue were decolorized by immersion for a few minutes in a 1 per cent solution of potassium cyanide. In the cases herein reported there was no alteration in the pigment after six hours' immersion in a 10 per cent solution of potassium cyanide.

Histologically, the deposit of the pigment granules in these cases conformed to the picture commonly observed in cases of argyria,[13] whether due to organic or inorganic silver preparations. This deposit is found in the upper layers of the corium; it extends well into the papillae and closely follows the contour of the basal membrane. These pigment granules lie in between, and surround the connective tissue fibers. They are discernible in the membrane lining the sweat glands and ducts, and they likewise outline the sebaceous glands. The smaller blood vessels are surrounded with this granular deposit, and it is found within the endothelial cells. Similarly, bismuth pigmentation of the mucous membranes has been described histologically by Azoulay,[14] Strempel and Armuzzi [15] and others. Microscopically, it is impossible to differentiate one pigment from the other.

13. Gans, Oscar: Histologie der Hautkrankheiten, Berlin, Julius Springer, 1928, vol. 2, p. 154. Habermann (footnote 3).

14. Azoulay, Robert: Stomatite bismuthique, Presse méd. **30**:134, 1922.

15. Strempel, R., and Armuzzi, G.: Zur Histopathologie der Wismutstomatitis mit experimentellen Beiträgen, Dermat. Ztschr. **42**:1, 1924.

According to Lowenfeld,[16] Strempel and Armuzzi,[15] the sections of tissue containing the black granules of bismuth sulphide are decolorized by a solution of superhydrol and changed into a white sulphate of bismuth, and then again become granules of the black sulphide when immersed in a hydrogen sulphide solution. These granules are also soluble in a 50 per cent solution of nitric acid, and are insoluble in a 1 per cent solution of hydrochloric acid and in a 10 per cent solution of potassium hydrate.

To produce direct evidence as to the etiologic factor in this discoloration, one of the patients (case 2) permitted the taking of an extensive biopsy. Two pieces of skin, each 10 cm. in length and about 3 cm. in width, were removed from the upper part of the scapular region. This material was turned over to Prof. William C. MacTavish, head of the department of chemistry at the New York University and Bellevue Medical College, whose report is given in the following section.

CHEMICAL, CRYSTAL, SPECTROGRAPHIC AND HISTOLOGIC STUDIES

Chemical Examination of the Skin for Presence of Silver and Bismuth.—Case 2.—Two strips of skin, each 10 cm. long and 3 cm. wide, were received. Only one strip was used.

The material was finely comminuted by means of a steel knife. The sample was 12 Gm. in weight.

The sample was extracted with acetone in a Soxhlet apparatus to remove moisture and fat. The residue after extraction was digested in a Kjeldahl flask with 30 cc. of concentrated sulphuric acid and 15 cc. of concentrated nitric acid. After twelve hours' digestion the organic matter was completely destroyed. The liquid remaining was evaporated to dryness in a porcelain dish. The brown residue was dissolved in a few drops of concentrated nitric acid. The solution was transferred to a centrifuge tube by means of a few cubic centimeters of distilled water. The porcelain dish was rinsed with a few drops of concentrated ammonia solution. This was added to the nitric acid solution. A drop of concentrated hydrochloric was added to the contents of the centrifuge tube. The solution was allowed to stand twelve hours.

A white amorphous solid settled out. This was collected at the bottom of the tube by centrifugalization. The clear solution was decanted off. This was marked solution A.

The insoluble amorphous residue was treated with concentrated ammonia. It did not dissolve entirely. The solution was centrifugated; the supernatent liquid was decanted, acidified with hydrochloric acid and saturated with hydrogen sulphide. A black precipitate formed that was separated by centrifugalization. This precipitate was washed with water and then redissolved in dilute nitric acid. A clear solution was formed. This solution was drawn into a capillary tube and dilute hydrochloric acid was added. An amorphous precipitate was formed. This

16. Lowenfeld, W.: Wismutsaum nach Nadisan Injecktionen, Zentralbl. f. Haut- u. Geschlechtskr. **13**:36, 1924.

precipitate was transferred to a slide, washed with water and then dissolved in concentrated ammonia solution. After evaporation of the ammonia solution, small characteristic crystals of silver chloride remained on the slide. The amount was estimated at between 0.5 and 1.5 mg. of silver.

Solution A was saturated with hydrogen sulphide. A slight black precipitate was formed. After washing it was dissolved in a small amount of nitric acid. The solution was tested with potassium cobaltic cyanide on a slide. If bismuth had been present, crystals of bismuth cobaltic cyanide would have been found.

The result was negative. If bismuth is present in the amount of skin examined, the amount must be less than 0.001 mg.

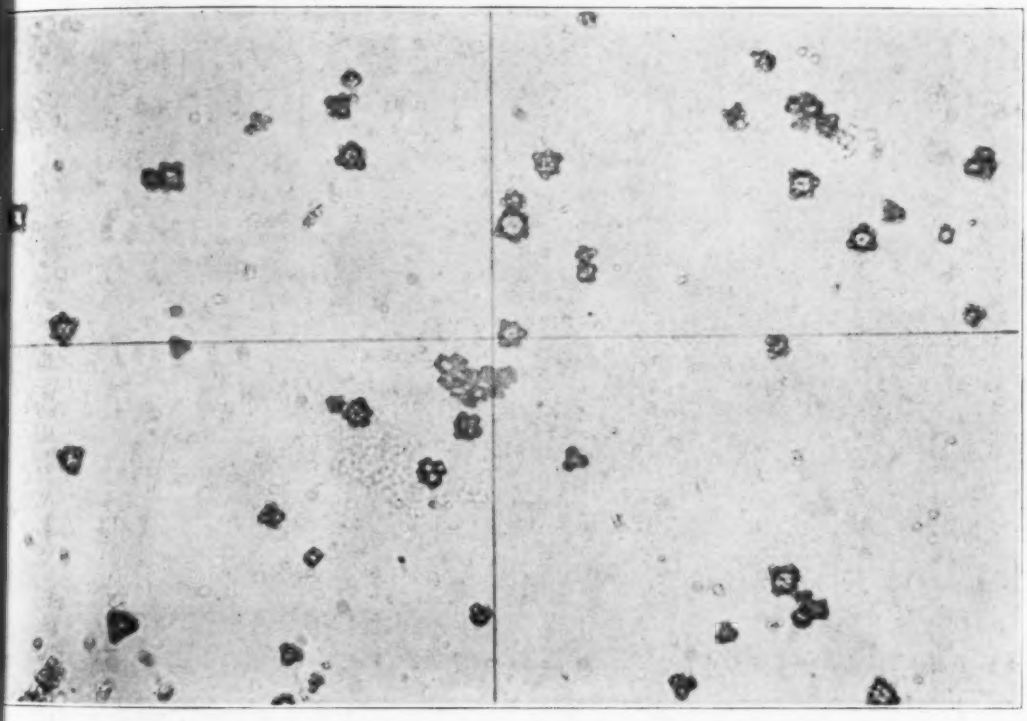

Fig. 1 (case 2).—The crystals of silver chloride. Leitz petrographic microscope. Reduced from a magnification of × 750.

Check determinations were carried out on all the reagents with negative results. The possibility of any of the vessels being a source of the silver was also eliminated.

Crystal Examination.—The crystals were examined by Mr. Herbert P. Whitlock, curator of mineralogy at the American Museum of Natural History, in a Leitz petrographic microscope for optical data; they reacted similarly to typical silver chloride in crushed fragments (fig. 1).

Spectrographic Examination.—To eliminate any doubt that the bismuth may have been lost in the chemical analysis or that the bismuth may still have been a causative factor in this discoloration, the remainder of the tissue, and also a piece

Fig. 2 (case 2).—Spectrograms of the ash from the skin.

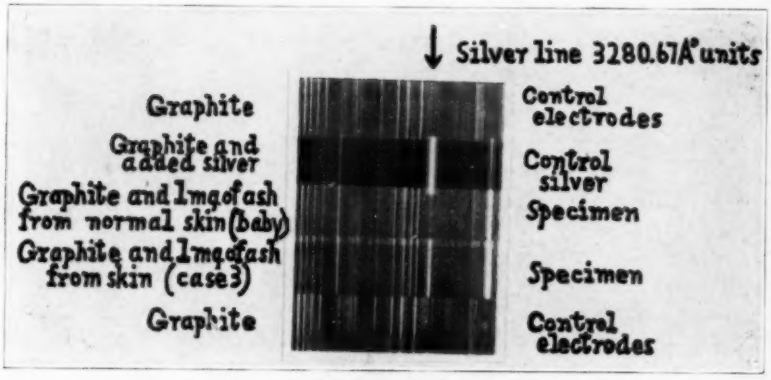

Fig. 3 (case 3).—Spectrograms of the ash from the skin, and of the ash from the normal skin of an infant 6 months of age.

Fig. 4 (case 3).—Spectrograms of the ash from the skin, and of the ash from the normal skin of an adult.

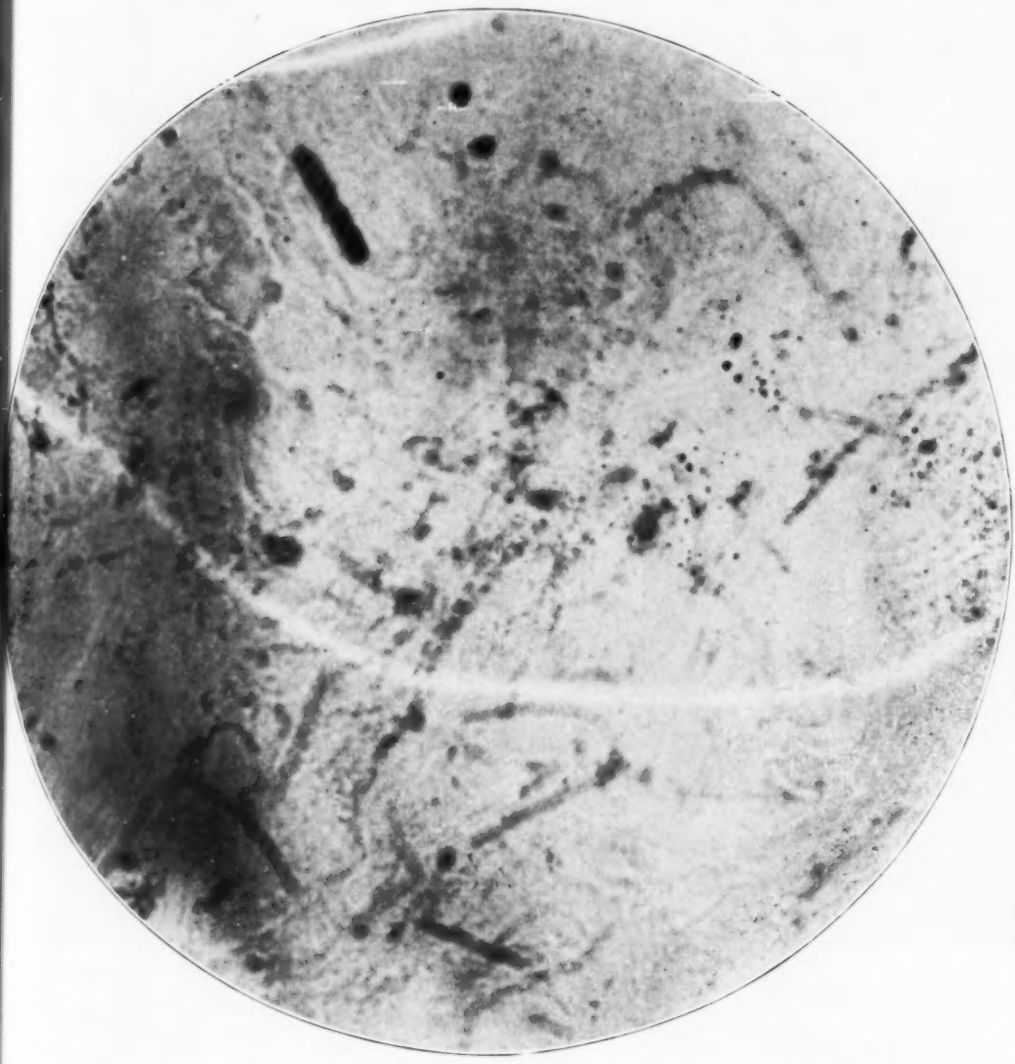

Fig. 5 (case 2).—Unstained skin from the scapular region after treatment with a 10 per cent potassium cyanide solution, showing the pigment granules in the corium. Reduced from a magnification of × 350.

of tissue 8 cm. in length and 3 cm. in width from case 3, was examined spectrographically to determine whether or not silver or bismuth or both were present in these tissues. Through the courtesy of Prof. Hal Truman Beans of the Analytical Chemistry Department at Columbia University, Dr. Andrew Dingwall performed these analyses and submitted the following reports.

The following specimens were submitted: specimen of skin from case 2, 10 by 3 cm.; specimen of skin from case 3, 8 by 3 cm. The spectograph used was the Hilger E1 and the excitation source the arc. Two types of electrodes were used, high purity graphite and high purity aluminum. The samples were

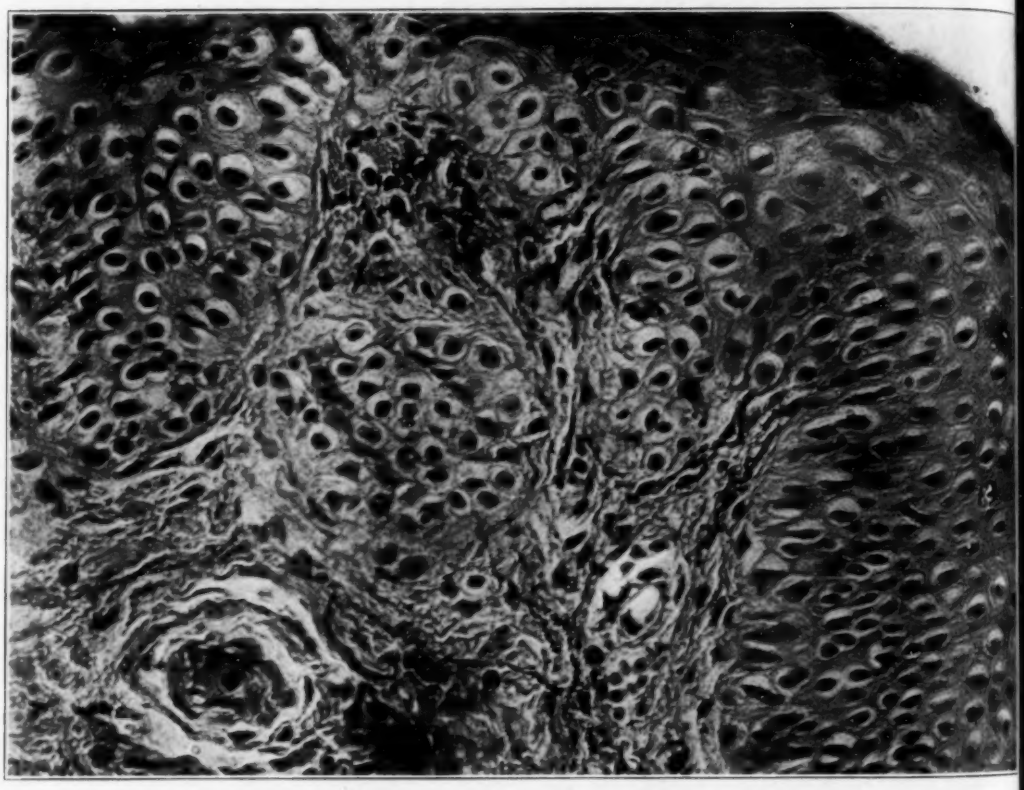

Fig. 6 (case 1).—Buccal mucous membrane, showing the thickened rete and corneous layer with considerable vacuolization of the epidermis. The pigment granules are in the tips of the papillae. Reduced from a magnification of × 420.

prepared for spectrographic analysis in three ways: by drying at 60 C., by charring at very low temperature and by ashing in oxygen at low temperature.

A control exposure of the electrodes was first made to insure the absence of silver in the electrode. The specimen was then placed on the lower electrode of the arc and the arc struck. A control exposure of added silver was then made for ease in identifying the silver line or lines present in the specimen.

In the cases examined (figs. 2, 3 and 4), silver was found to be present as indicated by the lines 3280.67 angstrom units and 3382.88 angstrom units. Speci-

mens of skin from a normal adult were also examined and found to contain silver. This suggested that silver might be a normal constituent of human skin, so samples were obtained from cadavers in which syphilis as a possible mortality factor was excluded as far as could be ascertained. These samples consisted of skin from two premature births (7 months), an infant at term and two infants 6 months old. Silver was found to be present in all of the samples examined.

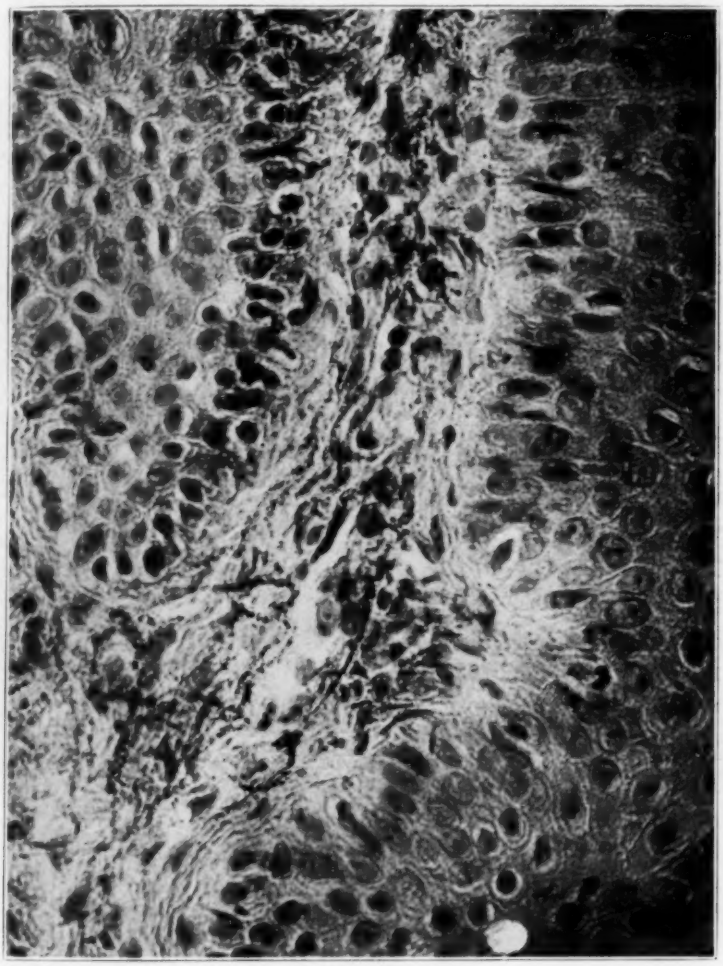

Fig. 7 (case 3).—Buccal mucous membrane, showing vacuolization of the epidermis and the pigment granules in the papillae. Reduced from a magnification of × 420.

In cases 2 and 3 bismuth was sought for and found to be present in case 3. This was determined by the presence of the line 3067.73 angstrom units.

In cases 2 and 3 a study of the accompanying spectrograms (figs. 2, 3 and 4) shows that the amount of silver present is many times greater than that present in normal skin.

Histologic Study of the Tissue.—Specimens of tissue were obtained from the buccal mucous membrane in all three of the cases, as well as from the labium majus in case 1. Pieces of tissue from the scapular region from the patients in cases 2 and 3 were also studied histologically. The stains used were hematoxylin and eosin. In unstained tissue sections the brownish-black granules were distinctly visible in the corium as small lines or irregular grouped masses of granular pigment (fig. 5).

The granular pigment deposit was essentially alike in all the sections examined. The epidermis in cases 1 and 3 from the buccal mucous membrane (fig. 6 and 7)

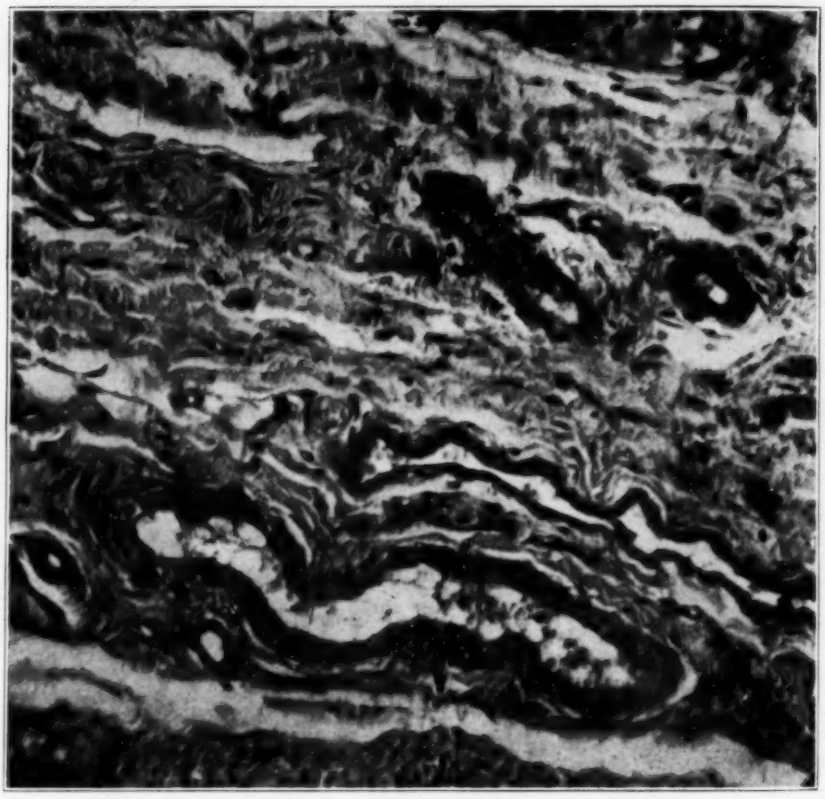

Fig. 8 (case 1).—Buccal mucous membrane, showing the thickened blood vessels and pigment granules in the endothelium; × 200.

was markedly thickened, particularly as to the rete and corneous layer, in which a great deal of vacuolization was found. In the other specimen the epidermis was approximately normal. The upper layers of the corium showed a distinct inflammatory reaction with numerous focal collections of round cells. The smaller blood vessels were markedly dilated, and the media of the arterioles was thickened (fig. 8). Directly beneath the basal epithelium and lying free in the spaces between the connective tissue fibrils of the papillae and upper layers of the corium were small dots ranging in color from brown to black, approximately one tenth

of the size of a red blood cell. These granules were arranged in lines or in small irregular masses that paralleled the fibers of the connective tissue between which they lay. They also followed the contour of the smaller blood vessels, and granules could be seen in the endothelial cells (figs. 9, 10 and 11*A*). No granules were demonstrable in the epithelium, nor were any visible in the connective tissue fibers. No granules were seen in the round cells. This layer of pigment deposit closely

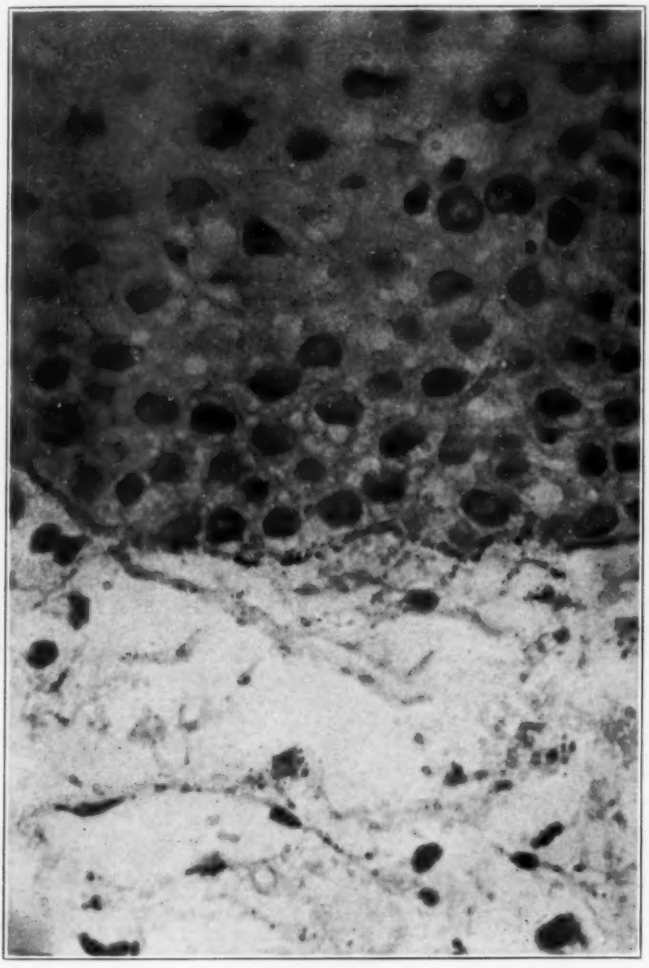

Fig. 9 (case 2).—Buccal mucous membrane, showing the pigment granules distributed along the basal layer. Reduced from a magnification of × 420.

followed the contour of the basal layer (figs. 9 and 11*A*), but the distribution was irregular. The layer was a narrow line varying in width from two to three connective tissue cell fibers.

These pigment granules did not decolorize after six hours' immersion in a 10 per cent solution of potassium cyanide, and also failed to decolorize with a super-

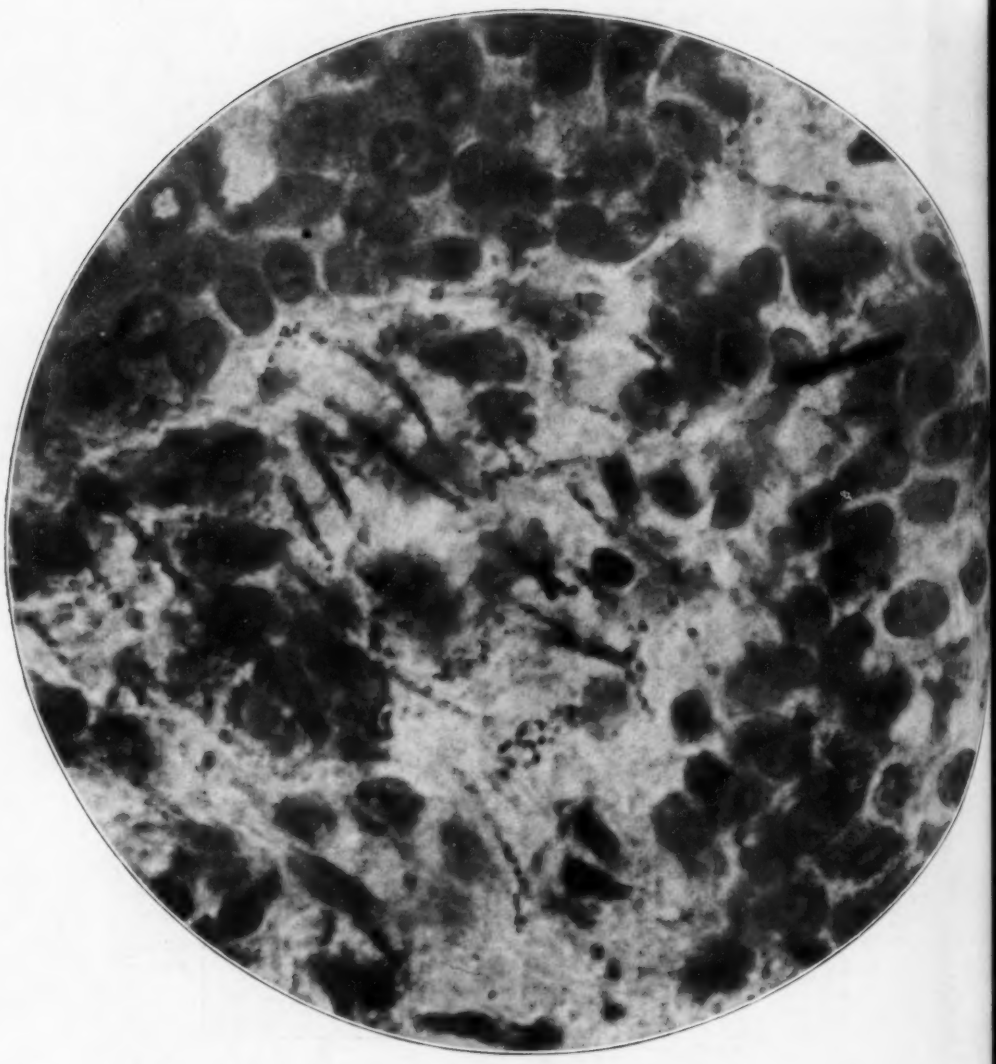

Fig. 10 (case 1).—Skin from labium majus, showing the pigment granules in fine lines in the corium. Reduced from a magnification of × 350.

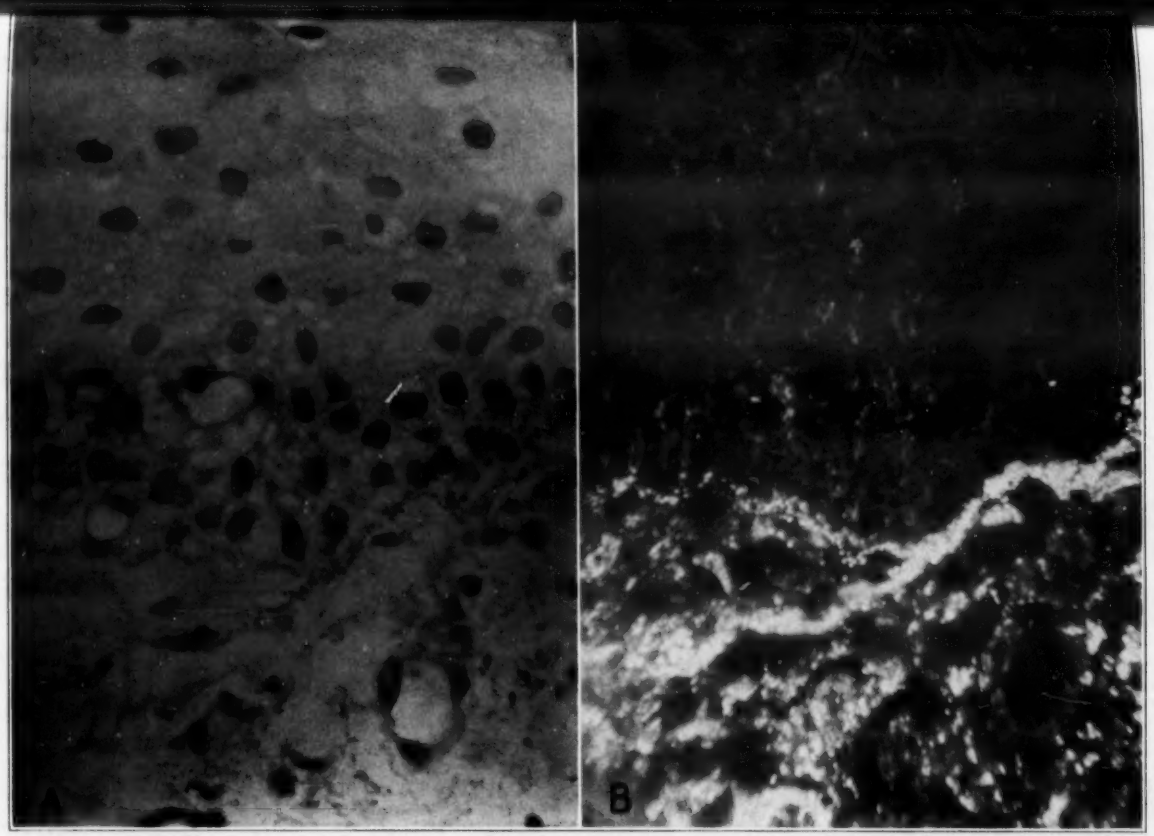

Fig. 11 (case 2).—*A*, buccal mucous membrane. Bright field illumination, showing the granules along the basal layer and the thickened blood vessels in the corium. Leitz apochromat, 2 mm. N. A. 132 (oil immersion) periplan ocular 8x. Reduced from a magnification of × 1,100. *B*, same field as in *A*. Dark-field illumination, showing the pigment granules by reflected light as bright dots lying along the basal layer and in the corium. Leitz apochromat, 2 mm. N. A. 132 (oil immersion) periplan ocular 8x. Reduced from a magnification of × 1,100. Bicentric dark-field condenser, N. A. 1.20. Liliput arc lamp, green filter and orthonon plate.

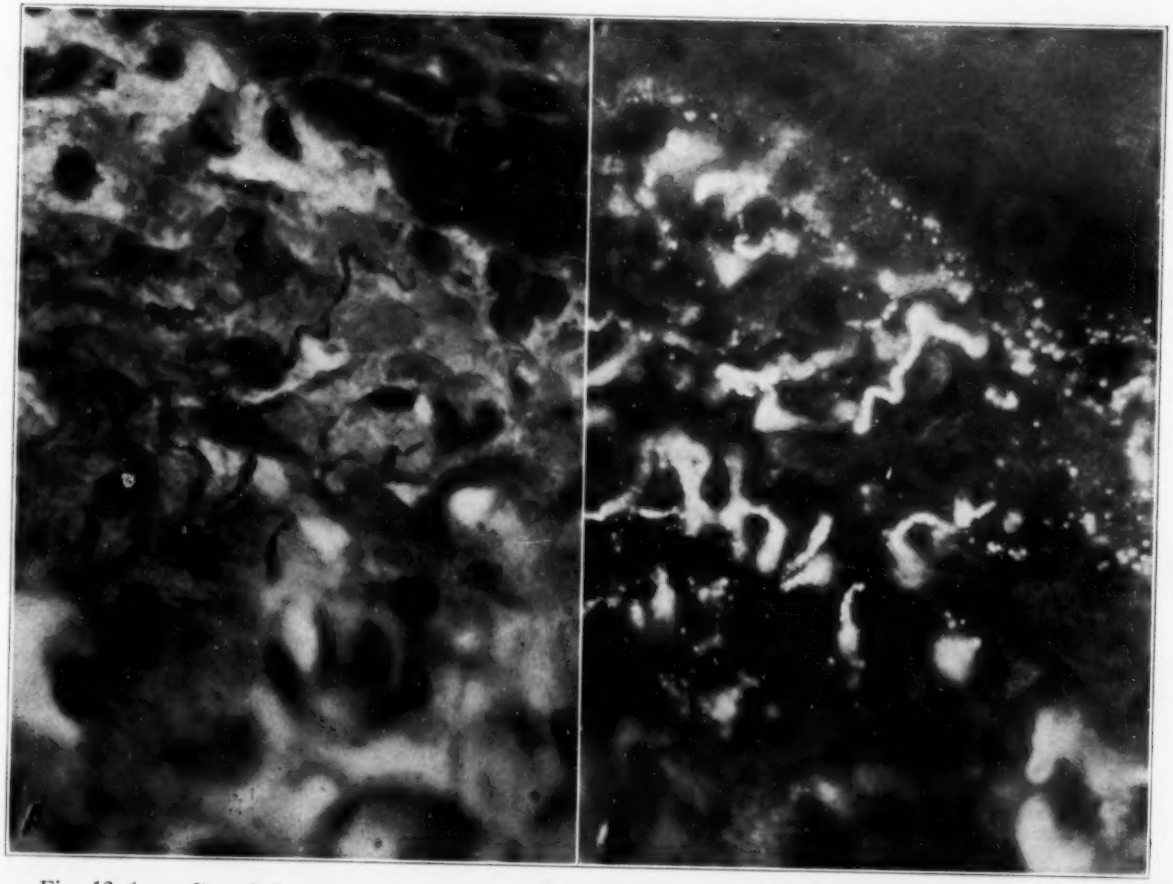

Fig. 12 (case 3).—*A*, buccal mucous membrane. Bright field illumination, showing the pigment granules in irregular masses and lines in the corium. Leitz apochromat, 2 mm. N. A. 132 (oil immersion) periplan ocular 8x. Reduced from a magnification of × 1,100. *B*, same field as *A*. Dark-field illumination. The pigment granules by reflected light show as bright dots and lines within the corium. Leitz apochromat, 2 mm. N. A. 132 (oil immersion) periplan ocular 8x. Reduced from a magnification of × 1,100. Bicentric dark-field condenser, N. A. 1.20 Liliput arc lamp, green filter and orthonon plate.

hydrol solution or with a 50 per cent solution of nitric acid. The prussian blue reaction for hemosiderin was negative, as well as the basic-fuchsin reaction for hemofuscin.

Sections were examined (figs. 11 and 12) from cases 2 and 3 by using a bicentric reflecting condenser for bright and dark-field illumination, a method similar to Erich Hoffmann's[17] dark-field technic. The pigment granules are made visible by reflected light, and owing to their higher refractive index and greater absorption coefficient, these granules stand out distinctly in the dark field, and appear as bright dots, thereby showing that this foreign granular deposit is not a hematogenous pigment.

SUMMARY AND CONCLUSIONS

1. A discoloration of the mucous membranes and skin resembling argyria is described in three patients who had received silver arsphenamine intravenously and bismuth intramuscularly over a prolonged period of time for the treatment for syphilis.

2. Chemical and spectrographic analyses of pieces of skin showed the presence of silver.

3. Bismuth could not be detected chemically, but was found spectrographically. The microchemical tests for silver and bismuth in tissue sections were negative in all three cases.

4. The finding of silver in the normal skin of new-born infants is worthy of note.

5. Silver arsphenamine, although a most potent arsenical in the treatment for the various manifestations of syphilis and especially for neurosyphilis, should not be given to exceed at total dosage of 8 Gm. because of the possibility of producing argyria.

Dr. George L. Rohdenburg and Dr. Frederik D. Bullock prepared the histologic material; Prof. William C. MacTavish made the chemical analysis, and Dr. Andrew Dingwall the spectrographic analyses; Mr. Herbert P. Whitlock examined the crystals, and Messrs. H. W. Zeiler and Oscar Soetbeer of the Leitz Company prepared the bright and dark field photomicrographs.

241 West One Hundredth Street.

ABSTRACT OF DISCUSSION

Dr. Marion B. Sulzberger, New York: There cannot be any doubt that Dr. Spiegel has proved his point that the pigmentation in these cases was due to silver. I had the opportunity of seeing two of the patients at a meeting of the New York Academy of Medicine, and there were certain features that made it

17. Hoffmann, Erich: Die Bedeutung des Dunkelfelds für die Untersuchung der Gelbfieber, Syphilis- und anderer Spirochäten sowie sonstiger Mikroorganismen und Schnitten (Leuchtbildmethode), Berl. klin. Wchnschr. **4**:73, 1921; Die als Leuchtbildmethode bezeichnete Art der Dunkelfelduntersuchung, in Kraus, Rudolf; and Uhlenhuth, Paul: Handbuch der mikrobiologischen Technik, Berlin, Urban & Schwarzenberg, 1922, vol. 1, p. 70.

seem that the conditions were not due to hemosiderin or bismuth. In the one case there was some hyperpigmentation of the mucous membranes, but the hyperpigmentation of the face predominated, so that the picture was not that of bismuth discolorations. In addition to this, the histologic observations ruled out melanin. In the first place, melanin is blanched out by hydrocyanic acid, and these deposits were not. The clinical picture and its persistence made it probable that the hyperpigmentation was due to silver. This theory was proved by the chemical observations.

Hyperpigmentation due to silver arsphenamine is rare. I have seen many injections of silver arsphenamine at Bloch's clinic and in Breslau. I have seen many of the patients over a period of five years, and I never saw a case of argyria originating from this source.

It would be interesting to find out why argyria develops in certain patients and not in others. That brings one back to the old question of idiosyncrasy, in this case not necessarily a sensitization. In the cases of argyria there may be an affinity between the cells and the silver that cause the latter to remain in the skin and not be eliminated, as in other cases in which the patients receiving treatment with silver.

The histologic picture that I saw here for the first time was interesting. The silver deposit is arranged in definite layers that are different from anything I have seen. Melanin is never arranged like that. In these slides one sees that there are wavy spirochete-like structures that have become impregnated with the metal. These structures are probably elastic tissue fibers or abnormally contracted connective tissue fibers. Perhaps a study of these structures in other parts of the patient's skin would reveal abnormal chemical affinities that might explain their attraction for silver.

More interesting than the demonstration of the argyrosis itself is the fact that Dr. Spiegel has called to our attention a method that has not been used before in the study of the chemistry of the skin, and linking this method up with the facts presented in Dr. Pillsbury's paper, it may prove well worth while to continue this type of investigation. Particularly the demonstration of the metallic ions is interesting, for these often act as catalizers. Perhaps the presence of hitherto unconsidered small quantities of metal may explain a great many now mysterious forms of change reaction. For instance, hypersensitiveness, which is in essence a speeding up of normal reactive processes, could very well be explained by the presence of catalizers. With the aid of this new method of determining the presence of infinitesimal quantities of metals, it may be hoped that light can perhaps be thrown on some of these now obscure mechanisms.

Dr. Fred Wise, New York: I had an opportunity to see the patients in the two cases that Dr. Spiegel presented, and I agree with the clinical diagnosis of argyrosis, but I made a mental reservation while examining these cases by artificial light, that the color was not typical of argyrosis. A typical argyrosis has a striking slate blue color that every one recognizes, and that occurs only in that condition. In these two cases there was a slight variation to a more yellowish hue. I thought that there might be a synergy between the bismuth and the silver, causing a different shade of pigmentation than one expects from pure silver. So far as I know, Dr. Habermann's case of argyrosis is the only one in the literature that occurred in a patient who received only the silver preparation. In all of these cases the possibility must be borne in mind that the discoloration may be due to silver alone or to silver and bismuth or to other extraneous combinations.

Another point that I wish Dr. Spiegel would clarify is whether any examinations have been made similar to those described by him in patients who have received large doses of silver arsphenamine, up to 8 Gm., who have had no discoloration of the skin; that is, whether control experiments have been made.

I think that this paper may well be compared with that of Dr. Pillsbury (so far as careful laboratory work is concerned), in that it represents a large amount of time and labor.

Dr. Hamilton Montgomery, Rochester, Minn.: Dr. Spiegel's paper is most interesting. Dr. Wise brought out the observation that a marked brownish hue to the skin was present clinically. This suggests to me an increased melanin pigmentation of the skin that could be confirmed by staining the sections with silver nitrate. I have seen cases of hemachromatosis in which the bluish hue to the skin was masked by an increase in melanin content in the epidermis so that the skin appeared to be brown. In cases of argyria, in ordinary hematoxylin and eosin preparations, it is easy to see the fine particles of silver deposited in the propria of the sweat glands, but it is not easy to distinguish between deposits of silver and melanin in the epidermis. By Hoffmann's dark-field method the silver deposits appear as brilliantly refractile particles not only about the sweat glands, but scattered throughout the cutis, apparently stopping abruptly at the epidermis. Melanin is not refractile. Mercury is not nearly so refractile as silver, and is not deposited in uniformly fine granules. This holds true for deposits of hemosiderin in hemachromatosis that can also be distinguished by staining with Mallory's potassium ferrocyanide method. I believe that the spiral-like arrangement of the silver deposits in the cutis in Dr. Spiegel's slides is due to the apparent affinity of the silver particles for the collagen and elastic fibers. Many of the collagen fibers were curled up in the hematoxylin and eosin preparations.

Dr. Karl Zwick, Cincinnati: Continuing Dr. Wise's line of thought, I am led to believe by Dr. Spiegel's paper that if one employs these several metals, simultaneously or successively, in the treatment of one's patients, not only the silver, but the mercury, bismuth and arsenic (arsphenamines) may become contributory factors in the pigmentation of the skin. But, just as it required the ingenuity of Dr. Spiegel to detect the silver by special methods, the other two metals also may require special methods for their discovery.

Dr. Montgomery's remarks serve to remind one that the administration of Ehrlich's arsenicals alone, that is, without silver or bismuth, may be followed by pigmentation, generally preceded by an exfoliative dermatitis.

Dr. Spiegel's abstract contains the statement that: "Silver arsphenamine . . . should not be given to exceed a total dosage of 8 Gm. as an argyria may result in susceptible people." But Kogoj published a report of a pigmentation of the skin and mucous membrane after a single course of silver arsphenamine, followed by two courses of mercury and neoarsphenamine. Kogoj explained the pigmentation as a combination of argyria and melanosis. Nevertheless, Spiegel's limitation of the dosage seems perhaps not quite restricted enough in view of this report.

Dr. Leo Spiegel, New York: I am very grateful for this discussion. In answer to Dr. Wise, this discoloration is a matter of degree; in some patients it is hardly perceptible. I have not seen any brown discoloration—it is slaty. This discoloration is first discernible on the buccal mucous membrane, and it is an indication that the use of silver arsphenamine should be discontinued. In Habermann's case only silver arsphenamine was given, and the total dosage

amounted to 22 Gm. As Dr. Montgomery said, hemosiderin is often deposited in clumps and can easily be differentiated. I bear him out in all he said. The pigment granules in these cases did not have to be intensified or developed, as they were readily visible in the tissue section. I agree that melanin would not show in the dark field, as I have shown, as melanin is a hematogenous pigment.

Answering Dr. Zwick, I know of no case in the literature in which one or two injections of silver arsphenamine produced discoloration. Bismuth causes a temporary discoloration in the mucous membranes that grows lighter and disappears within a period of six months when the drug is discontinued. The discoloration from silver arsphenamine, however, is permanent.

IONIC MEDICATION IN DERMATOLOGY

PRINCIPLES, EXPERIMENTAL CONFIRMATION AND CLINICAL APPLICATION *

LOREN W. SHAFFER, M.D.
DETROIT

The introduction of drugs into the human body by means of an electric current has fascinated medical physicists for more than a century. According to Turrell,[1] ionic medication was enunciated as long ago as 1747 by Veratti. Jones [2] stated that Palaprat claimed to have introduced iodine into the tissues in this way in 1833. There are an increasing number of references in the literature since this date: Richardson, 1859; Burns, 1870; Mink, 1873, and Gauthier, Morton, Edison and Foveau de Cournelles in the early nineties. The idea, however, was imperfectly understood and consequently failed to attract attention and made no progress. The general application of the theory, as a practical question in therapeutics, must be credited to Leduc, who, in a series of papers beginning in 1900, brought it forcefully before the medical profession. Considerable literature on the subject has accumulated since this date.

One hesitates to announce this subject for serious consideration. The reason for such reticence is fairly obvious. Some acclaim ionic medication with enthusiasm based on slight clinical experience and without scientific or experimental background for their claims. Others condemn it with an almost equal degree of vehemence. It is difficult for the physician with little or no practical experience to know where the truth lies. This, with the gullible acceptance of all methods of physical therapy by charlatans and pseudo-ethical physicians, makes it necessary to touch on this subject with care.

Ionic medication would seem to be of value in a limited sense in the field of dermatology, and a review of the subject, with such experimental and clinical observations as I have been able to make, I hope, may prove of interest.

PRINCIPLES INVOLVED

The principle of ionic medication, or the use of constant current for the purpose of introducing drugs into the human body, is most com-

* Submitted for publication, March 17, 1930.

* Read at the Fifty-Third Annual Meeting of the American Dermatological Association, Cleveland, June 19, 1930.

1. Turrell, W. J.: Therapeutic Action of the Constant Current, Proc. Roy. Soc. Med. **14**:41 (July) 1921.

2. Jones, H. L.: The Principles of Ionic Medication, Proc. Roy. Soc. Med. **1**:65, 1907.

monly spoken of in the English and French literature as "ionization," although the term "iontophoresis," commonly used in Germany, or even better that of "percutaneous electro-osmosis" (Rein [3]) is more expressive.

Electrolysis, according to Faraday, is the sum total of the physicochemical phenomena which are produced in the solution of certain bodies called electrolytes (acids, bases and salts) when a galvanic current is made to traverse these solutions. Part of the molecules of the dissolved bodies are dissociated into ions, some always positive, others always negative. When such solutions are traversed by a galvanic current, the positive ions (kations) are drawn toward the negative electrode (metals, hydrogen, alkaloids); the negative ions (anions), toward the positive electrode (acid radicals, hydroxyl and the halogens).

The human body may be considered schematically as an electrolytic solution of sodium chloride, although many other electrolytic substances are present, as well as nonelectrolytic substances (urea, sugar, albumin, fats, etc.), which retard the passage and distribution of ions. The cellular elements, being separated from one another by membranous partitions, allow the phenomena of cataphoresis (slight diminution of moisture in the tissues in the neighborhood of the positive pole and increase of moisture in the neighborhood of the negative pole to come into play. One great source of error in applying the principles of electrolysis as developed in electrolytic solutions of commerce (electroplating, refining of copper, etc.) is the failure to bear in mind the circulation of the blood and lymph, which carries away the very slowly moving ions before they have an opportunity of penetrating, to only a slight depth, into the living tissue.

The polar and peripolar effects of the passage of the galvanic current through the body, considered as an electrolytic solution of sodium chloride, may be summarized as follows. The primary effect is the dissociation of sodium chloride into Na^+ and Cl^- ions, with the sodium collecting at the negative pole and chlorine at the positive. These ions lose their charge on contact with their respective poles and take on their chemical affinities, uniting with water after the formula:

$$(-\text{ pole})\ 2Na + 2H_2O = 2NaOH + 2H$$
$$(+\text{ pole})\ 2Cl + H_2O = 2HCl + O$$

Therefore, the negative pole quickly becomes alkaline, and hydrogen is evolved. The positive pole quickly becomes acid, and nascent oxygen is freed. Finally, this acid or this base may unite with the tissues to produce tertiary effects of cauterization or coagulation, or with the metal of the electrode to form new products, such as chloride of zinc, which

3. Rein, H.: Percutaneous Electro-Osmosis or Iontophoresis, Klin. Wchnschr. **4**:1601 (Aug. 13) 1925.

in their turn exercise a new action on the tissues. For this reason, it is necessary to keep the electrodes protected from contact with the skin by a thick pad of gauze or felt soaked with the electrolyte, unless these tertiary effects are desired (in contradistinction to diathermy, in which alternating current is employed, and the rapid alternations of poles neutralize the chemical effect).

Most metals, except aluminum, are little open to attack by bases and can serve indifferently as the negative electrode, but practically all metals, except platinum, are attacked by acids and must be carefully selected for their desired effect when used for the positive pole. When electrolysis is employed for epilation, platinum is the only safe metal to use with the positive pole (iron = iron chloride = tattoo), while steel needles can be used with safety if the negative pole is employed.

In a general way, the contrasting physical and chemical properties of the two poles may be summarized as in the accompanying table.

Contrast of Negative and Positive Poles in Electrolysis

Negative Pole	Positive Pole
Alkaline reaction	Acid reaction
Hydrogen (abundant)	Oxygen (sparse)
Increases bleeding	Stops hemorrhage
Irritative	Sedative
Causes inflammation	Soothes inflammation
Vasodilator	Vasoconstrictor
Softens and liquefies tissue	Hardens tissue and dries discharge
Noncontractile scar	Retractile scar
Nonbacteriocidal	Germicidal

These primary physical and chemical effects, as well as the secondary and tertiary ones often evolved, undoubtedly play an important rôle and probably are more important than the medicament used in ionization.

Faraday showed that the amount of chemical action produced in any solution of an electrolyte is exactly proportional to the amount of electricity which has passed. Tables of electrochemical equivalents have been calculated which enable one to determine the quantity of any ion set in motion if the amount of current and the duration of flow are known. For example, suppose zinc ions to be driven into the skin of a patient with a current of 15 ma. for ten minutes, the calculation would be as follows: The amount of zinc set in motion by a current of 1 ampere running for one second is 0.00034 Gm.

15 milliamperes = 0.015 ampere
10 minutes = 600 seconds
$0.00034 \times 0.015 \times 600 = 0.00306$ Gm. = 3 mg.

By weighing the zinc electrode before and after an application, such calculations may be confirmed. It is equally applicable to solutions, but

in the human body other complex factors are present which render such calculations inaccurate, especially for the heavy metals.

In addition to calculations of the amount of any substance set in movement, it is required for medical purposes to know the depth to which the drug can be made to penetrate in the time of its application. Knowledge of this point is not complete, and it has been ignored by practically all writers on ionic medication. The impression is conveyed that ions move rapidly and that in a short treatment of from five to fifteen minutes, great depth of penetration has been secured. Sir Oliver Lodge has given the following rates for certain ions when impelled by an electrolytic pressure of 1 volt per square centimeter: hydrogen, 10.8 mm. per hour; potassium, 2.05 mm. per hour; sodium, 1.26 mm. per hour; chlorine, 2.16 mm. per hour, and iodine, 2.16 mm. per hour. The rates of migration through simple conductors supply only rudimentary information as to the behavior of ions driven into an electrolyte with such a complex composition as the human body, and this question will be considered more in detail under experimental work.

It will be seen from the foregoing comment that the number of ions set in motion depends directly on the amount of current (milliamperage), while the rate of penetration of the ions depends directly on the voltage. It has been the custom in clinical work to report only the milliamperage and the time of application. For accuracy in duplicating clinical work, since the two are not necessarily parallel, the voltage used and the size of the areas treated, as well as the milliamperage and the time of application, should be reported.

EXPERIMENTAL WORK REPORTED IN THE LITERATURE

Leduc [4] showed that strychnine could be driven through the skin of a rabbit in sufficient quantities to produce death, when applied at the positive pole. The same, when applied under the negative pole or simply by soaking the skin, failed to produce any symptoms of toxic absorption. Finzi [5] proved that the ferricyanide ion could be readily carried through the skin of a monkey. Inchley [6] repeated these experiments, using cats, rabbits and guinea-pigs, and showed further that it was possible to introduce a number of other alkaloids, some metals and certain negative ions. He concluded that the current has no further appreciable influence on foreign ions after penetration through the skin. Pack, Underhill, Epstein and Kugelmass,[7] working also with animals, confirmed the work

4. Leduc, S.: Les ions et les médications ioniques, Paris, Masson & Cie, 1907.

5. Finzi, N. S.: Some Experiments with Ionic Medication, Arch. Roentg. Ray **17**:423 (April) 1913.

6. Inchley, O.: Influence of the Electric Current on the Absorption of Drugs, J. Pharmacol. & Exper. Therap. **18**:241, 1921.

7. Pack, G. T.; Underhill, F. P.; Epstein, J., and Kugelmass, I. V.: Experimental Studies on Electro-Ionic Medication, Am. J. M. Sc. **167**:625, 1924.

of Inchley and added still other drugs susceptible of ionization. They further stated that in the use of the heavy metals, such as mercury, magnesium, zinc and lead, the ions of these metals give up their electric charge as soon as they enter the skin to other much faster traveling ions in the tissues. These metals then enter into combinations with the proteins and salts of the tissues or may form precipitates. Heavy metals may therefore be effective for purely local administration, but not for systemic effect.

Campbell [8] and Bourguignon [9] showed that iodine can by ionization be introduced into man in easily demonstrable amounts. Bourguignon showed that the quantity recovered in the urine was within 30 per cent of the total amount that should have entered the body, as estimated from the table of electrochemical equivalents.

Campbell [8] and Turrell,[10] writing independently, summarized the present status of medicament by ionization, as confirmed by experimental data, in much the following way:

> The amount of any drug introduced in an ionic state into the body, by currents which can be used therapeutically, is very small. The drug as soon as it is carried through the skin is swept away in the blood stream, and produces its specific action on the system generally. There is therefore no evidence of local concentration. In this way poisonous drugs can be introduced in effective amounts, but the dosage by this method is so uncertain as to render it a very unsafe one. There is no evidence of deep penetration. On the contrary, in animals the experimental evidence is all against the drug penetrating farther than the subcutaneous tissue. In man it seems to be quite clear that a similar state of affairs exists.

Ionization is therefore not suited to general medication, but only for topical applications to the skin and mucous membranes.

Leduc,[4] Jones [2] and Friel [11] outlined a number of physical experiments which they have performed to show the penetration of ions. Friel by the passage of zinc ions through glass U tubes containing gelatin and blood serum inoculated with *Bacillus coli* showed that the ions passed, not only by the coagulation of the serum, but by the sterilization of the portion reached by the ions, as was proved on incubation. Jones showed that the ions of iron, iodine and copper could be made to pass readily through many layers of parchment under the influence of ionization. He, I believe, is the only one who discussed the rate of penetra-

8. Campbell, D.: Ionic Medication, Brit. M. J. **1**:409 (March 10) 1923.

9. Bourguignon, G.: Estimation of Iodine Introduced and Eliminated in Ionization, Arch. Radiol. & Electrotherap. **27**:139 (Oct.) 1922.

10. Turrell, W. J.: Action of the Constant Current with Special Reference to Its Action on the Subcutaneous Tissues, Arch. Radiol. & Electrotherap. **27**: 130 (Oct.) 1922.

11. Friel, A. R.: Zinc Ionization Considered from the Electrical and Bacteriological Standpoint, Arch. Physical Therapy **10**:104 (March) 1929.

tion; he stated that the ions penetrate about one thickness of parchment paper (0.2 mm.) per minute under the conditions of the experiment (20 ma. of current per square centimeter). This is about ten times the maximum tolerated dose in man and if the conditions could be transposed would mean a penetration of only about 0.02 mm. per minute or, for the ordinary treatment of fifteen minutes, a penetration of about 0.3 mm. ($\frac{1}{75}$ in.), which is extremely slight.

EXPERIMENTAL WORK OF THE AUTHOR

I have attempted to demonstrate the rate of penetration or movement of ions by a number of experiments.

When a 1 per cent solution of ferrous sulphate is in one beaker and a physiologic solution of sodium chloride in another and the beakers are connected with a glass U tube containing gelatin to which potassium ferrocyanide has been added as an indicator, when the positive pole is in contact with the ferrous sulphate solution and the negative with the saline solution, the ferrous ions should pass up the arm of the U tube toward the negative pole. This movement will be detected by a blue discoloration of the gelatin, i. e., the formation of the Prussian blue reaction. Similarly, the movement of copper, iodine, silver, zinc, etc., can be detected by appropriate indicators. Without tiring my readers with the details of these experiments, I may state the observations in the following summary fashion:

1. The rate of penetration depends on the voltage. Ordinarily, the milliamperage increases directly as the voltage, and a higher milliamperage means a higher voltage. By using a poor conductor (pure gelatin in distilled water) a high voltage is required to permit the passage of even a few milliamperes. By adding sodium chloride to the gelatin it becomes a good conductor, and the same voltage transmits a high milliamperage. Under these conditions, the rate of penetration depends on the voltage regardless of milliamperage (as stated in the previous law) and a current of 1 ma. at 90 volts will penetrate approximately three times as far as a current of numerous milliamperes at 30 volts pressure, although the number of ions in transit will depend on the milliamperage.

In clinical work, if good conductors and fairly large surfaces are used, this is not such a great factor. It may possibly explain why certain poor electrolytes, such as quinine, are credited with clinical results not obtainable with, for instance, physiologic solution of sodium chloride. It may really be due to the greater counterirritant effect of a current of higher voltage. As stated by Turrell,[10] sodium conductivity is three times as great as quinine and 10 ma. with quinine is really equal to 30 ma. with saline solution at the same voltage.

2. Under the same voltage, various ions travel at different speeds. In my work using the ions mentioned there was a variation of at least 100 per cent in their speed of penetration. I am not satisfied with this phase of my study, and the information is not of sufficient accuracy to tabulate. Accurate information on this point would be valuable in enabling one to choose one's drugs more intelligently.

3. These ions moving through gelatin and under conditions of conductivity at least as good as that used in clinical work, with the aforementioned considerations applied, moved at surprisingly slow speed. Under such experimental conditions, one is prone to use much higher voltage and milliamperage than is tolerated for clinical use. When transposed into terms of 2 ma. per square centimeter and applied for the average treatment period of fifteen minutes, penetration varied between depths of from $\frac{1}{25}$ to $\frac{1}{125}$ in. (from 1 to 0.2 mm.), with the majority of the experiments figuring between $\frac{1}{60}$ and $\frac{1}{80}$ in. (0.2 to 0.3 mm.). It is readily seen that if these figures (in confirmation of Jones) can be considered even roughly applicable to man, entirely too rapid penetration has been expected of drugs by ionization.

I next attempted to determine the rate of penetration of ions in tissue. A thick pad of gauze saturated with 2 per cent ferrous sulphate solution was connected to the positive pole. It was covered with a sheet of rubber dam in the center of which was cut an opening 1 sq. cm. in size. Directly over this opening, a piece of liver several centimeters thick was laid. This was again covered by a sheet of rubber dam as before and over the opening was placed a pad of gauze saturated with physiologic solution of sodium chloride and attached to the negative pole. After ionization, the depth of penetration was determined by cutting a section the full thickness of the portion ionized, and soaking it in 5 per cent potassium ferrocyanide. The tissue was stained dark blue to the depth of the penetration of the iron ions: 20 ma. for two and one-half hours penetrated $\frac{7}{8}$ in. (2.2 cm.); 2 ma. for twenty hours penetrated $\frac{3}{4}$ in. (1.9 cm.), and 3.5 ma. for sixteen hours penetrated 1 in. (2.5 cm).

Again figuring this in terms of a treatment unit of 2 ma. for fifteen minutes per square centimeter, one has 100, 80 and 112 unit doses, respectively, or $\frac{7}{800}$, $\frac{3}{320}$ and $\frac{1}{112}$ in. (0.022, 0.023, 0.022 cm.) of penetration per unit dose, which is only slightly less than for the average of the previous work and certainly slow penetration.

It was next attempted to determine the rate and mode of penetration of the human skin. There are many problems in connection with this that offer interesting speculation. In the first place, the stratum corneum is a nonconductor of electricity. According to Leduc and Ehrmann, the ions penetrate into the skin by the glandular orifices. They based their claims on the staining of these orifices by potassium

permanganate when used for ionization. The hair and probably its follicular lining is a nonconductor because of its keratotic character. The sebaceous glands containing sebum are also nonconductors. This leaves the coil glands as the main portal of entry for weak electric currents. By drying the skin thoroughly, it is easily demonstrated that weak currents fail to pass, but with a slight amount of perspiration present the current passes readily.

The skin of laboratory animals being of different structure and lacking the same glandular elements is not suitable for such experimentation. It was decided to use fresh human skin secured at autopsies and to perform experiments with ionization on patients after death, for the postmortem study of whom permission had been secured. While it would be desirable to work on living patients, such opportunities are difficult to secure, and there should be little if any difference considering the object in view, i. e., a study of the penetration of the superficial layers of the skin.

Finzi,[5] experimenting on animals with the same object in view, stated that the ferrocyanide ions can be traced through the skin and subcutaneous tissue into the muscle. They are seen in large quantity in the capillaries of the subcutaneous tissue. The subcutaneous tissue is stained a more intense blue than the superficial layers. Copper ions are deposited entirely in the epidermis, not even reaching the corium. Ferrous ions give an appearance almost identical with those of ferrocyanide, while ferric ions behave similarly to those of copper. Calcium ions are found deposited in and beneath the corium. Attempts to demonstrate zinc and mercuric ions failed.

He demonstrated what he believed was penetration of the ferrocyanide ion into the knee joint of a monkey, and it acted as an impetus to those workers using the method for treatment for arthritis with salicylates. Others, rechecking this experiment on laboratory animals, have not been able to demonstrate penetration deeper than the subcutaneous tissue, and the work is discredited, as previously stated.

Inchley [6] rechecked the penetration of the skin with ferrous sulphate, and a detailed histologic report by J. F. Gaskell showed practically the same observations as those summarized by Finzi.

In such experiments, the tissue has been removed and either soaked in the solution used for demonstrating the ions macroscopically by their color reaction (for ferrous sulphate, potassium ferrocyanide; for copper, potassium ferrocyanide; for iodine, mercuric chloride, etc.) or fixed, sectioned and then stained with these solutions.

In my work, in gross determinations, it was observed that such staining (particularly for ferrous sulphate or potassium ferrocyanide, which depend on the Prussian blue reaction) formed a diffusible color

reaction. I therefore believe that such reports of deep penetration in living tissue were caused by a failure to consider such diffusion.

I submitted squares of skin to ionization of drugs for fifteen, thirty and sixty minutes, using from 2 to 10 ma. of current per square centimeter. The drugs used were 2 per cent solution of potassium ferrocyanide, ferrous sulphate, mercuric chloride, copper sulphate and silver nitrate. As a control, a piece of gauze saturated with each of these solutions was laid on a square of skin and permitted to act for one hour. On the completion of each experiment, two small blocks were cut from the portion subjected to ionization of the drug and washed in water. Frozen sections were made from one block at once, soaked in the test solution and examined microscopically (for the silver nitrate I used Levaditi's reducing agent: solution of formaldehyde 5 cc., pyrogallic acid 4 Gm., water 100 cc.). The other block was soaked for at least forty-eight hours in the test solution, fixed in a solution of formaldehyde and embedded in paraffin, and permanent sections were made, one being left unstained and one being stained lightly with hematoxylin and eosin.

Sections made from blocks that had been subjected to ionization for one hour at the higher milliamperage were denuded of epithelium in practically all cases. In such specimens, vesicles and bullae were present, easily recognized macroscopically, which accounted for the absence of epithelium. It showed the destructive effect of high milliamperage employed for long periods. The frozen sections were unsatisfactory for detailed study, largely as the result of technical difficulties in cutting.

The results of this study on the paraffin-embedded sections may be summarized as follows:

Potassium Ferrocyanide.—The ions of potassium ferrocyanide were demonstrated by 5 per cent ferrous sulphate. The control showed no staining of the epidermis. However, it presented a pale blue staining of the corium and all the subcutaneous structures, which was discernible only with low magnification. The fifteen minute section was similar to the thirty minute section, but less intensely stained. The thirty minute section showed a dense dark blue pigmentation of the stratum corneum, with the deeper layers of the epidermis unstained. There was no evidence in these sections of how penetration of the epidermis is accomplished. The hair follicles that were present did not show evidence of penetration deeper than the surface depression. There was no suggestion of sweat glands penetrating the epidermis or the pars papillaris. The corium was diffusely stained a robin's egg blue, with accentuation about blood vessels. Subcutaneous tissues were even more deeply stained. The question of the mode of deep penetration is not the problem here, but I believe that the observations in these structures may have been partly due to a diffusion of the stain.

Ferrous Sulphate.—The ions of ferrous sulphate were demonstrated by 5 per cent potassium ferrocyanide. The sections of skin treated with ferrous sulphate were much better for the purpose in view than those

treated with the cyanide. No pigmentation whatever could be demonstrated in the control. The fifteen minute specimen showed rather marked bluish pigment throughout the stratum corneum. For the most part, the remaining layers of the epidermis were unstained, but in certain areas the bluish pigmentation was well defined extending to the basal layer, and occasionally even the cells of the basal layer were stained a diffuse blue. This was not sharply localized as if it occurred only about a follicular opening, but was more diffuse as if it was a point of good contact and the current was penetrating the epidermis as a whole. In this section, the upper portion of the corium was stained a diffuse blue, in which were interspersed numerous fine granules of dark blue pigment. I took these to be the granules of iron that had passed under the influence of ionization and the diffuse pale blue to be due to diffusion of the stain. The skin in question was that of a negro baby, aged 8 months. There were a number of cylindric ducts lined with a single layer of large columnar epithelium in the pars papillaris, with definite openings through the epidermis, which I think were coil ducts, although lacking the corkscrew outline associated with the adult type. The sections were not entirely satisfactory, and a further check will be carried out. About these ducts, the pigmentation was intensified, as if they formed a portal of entry for the current. The thirty minute section had the same appearance as the fifteen minute section, although the tissues were stained more intensely blue. Questionable sweat ducts were also present, although not so well defined.

Mercuric Chloride.—The mercuric chloride ions were demonstrated by 5 per cent sodium iodide, which yields an orange color of mercuric iodide. The mercuric chloride sections failed to show any staining of mercuric iodide and were therefore discarded.

Silver Nitrate.—The ions of silver nitrate were demonstrated by reducing with Levaditi's reagent which yields a black color for reduced silver. It was felt that by reducing the silver at once any opportunity for the diffusion of pigments would be overcome, and results in these sections would be more dependable. Unfortunately, silver does not penetrate well and has a tendency to be precipitated on the skin, making it a poor drug for ionization.

The control showed no evidence of penetration deeper than the corneum and only a slight granular deposit in the upper layers of this. The fifteen minute specimen showed a thick black deposit extending the thickness of the corneum with an occasional granule in the stratum granulosum or mucosum. The thirty minute specimen showed a dense black deposit, in spots extending to the basal layer of the epidermis. This seemed to be bandlike and not funnel-shaped, as would be expected if penetration was limited to the glandular orifices. In general, the

corium was not infiltrated, but occasionally there were small areas in which numerous black silver granules extended almost through the corium to the subcutaneous tissue. These granules in the area involved were diffusely scattered and not limited to connective tissue of blood vessels, etc. The sebaceous glands, hair follicles and deeper coil glands were not involved. In several places there were suggestions of coil ducts in the pars papillaris, but not definite. These localized areas of granules in the corium were suggestive of a portal of entrance, but definite proof is lacking. In several places, hair follicles could be traced through the epidermis, but except for their surface openings they were free from silver.

Copper Sulphate.—The ions of copper sulphate were demonstrated by 5 per cent potassium ferrocyanide. The control showed a few granules scattered through the corneous layer only. The thirty minute sections showed a large number of granules in the stratum corneum, but not bandlike, and a few scattered granules throughout the epidermis. Numerous granules were present in the upper half of the corium, but were diffusely scattered. There was no clue to the method of penetration.

In general, then, this study has failed to demonstrate, in any conclusive manner, the paths of penetration of the epidermis under ionization. The sections throughout have shown a tendency to localization of the areas of penetration to segments of the epidermis, but this may be a physical one due to better contact at these points. The suspicion that the glands may be important portals of entry is strengthened by this study, but unfortunately my sections fail to prove this point. I also believe that after the stratum corneum is well soaked with electrolytes it is not an efficient insulation, and that a portion of the current, at least, may penetrate directly through the epidermis to the nearest papillae of the pars papillaris. Undoubtedly, in life when the ions reach the corium they are rapidly carried away by the circulation of the blood and lymph.

CLINICAL APPLICATION

As previously inferred, ionization has been enthusiastically advocated by numerous early writers as a means of treating localized, deep-seated lesions. Ellis [12] quoted Leduc as saying, "It is difficult to imagine how ludicrous will appear in the future our present day method of scattering through the whole body harmful substances particularly noxious to the most delicate and important tissues, such as nerve centers, in order to act upon a very limited part of the body which happens to be diseased." Yet this method has failed, and the theory of ionic medication has been abandoned by most advanced workers, except for topical applications. It still has numerous advocates in gynecology, ophthalmology, otology and dentistry.

12. Ellis, L. E.: Ionic Medication, Arch. Roentg. Ray **19**:365, 1914-1915.

In dermatology, it has been recommended as a method of treatment in many conditions. Among these conditions may be mentioned pruritus ani and vulvae, coccigenic sycosis, dermatitis papillaris capillitii, acne vulgaris and rosacea, furunculosis, keloids, verruca vulgaris, alopecia areata, tineal infections of the scalp, beard and cutaneous surfaces, lupus vulgaris and erythematosus, actinomycosis, blastomycosis and, in short, practically all types of chronic infections of the skin.

As at its best this method is complicated, technical, tedious and time-consuming, it is necessary to analyze its value critically. When simpler methods are equally reliable, ionization is not deserving of consideration. Any method that is safe to use and that would offer a high percentage of good results in some of the resistant chronic infections, no matter how tedious or time-consuming, is deserving of critical consideration. In the group of resistant chronic infections belong pruritus ani, lupus vulgaris, actinomycosis, blastomycosis, coccigenic sycosis and dermatitis papillaris capillitii.

This method of treatment has been brought to attention in the American literature particularly through its use in pruritus ani, as reported by Buie,[13] Oliver [14] and others. The dermatologic literature of England, France and Germany contains many references to the clinical value of the method. Several writers recommend its use in lupus vulgaris. Whitfield [15] reported an excellent result after rather prolonged treatment with zinc sulphate ionization in a case of lupus vulgaris with rather widespread involvement of the buttocks. Wirz [16] reported excellent results in two cases of actinomycosis that were resistant to the usual treatment with iodides internally, x-rays, etc. He advocated the method in trichophytosis, coccigenic sycosis, erysipelas, lupus erythematosus (ionizing with 4 amino-2 auro-thiophenol carbonic acid), and for local anesthesia. Sladkowitsch [17] employed quinine for ionization in twenty cases of lupus erythematosus and reported excellent results in five cases and definite improvement in twelve cases, with three patients stopping treatment. Treatment was employed at short intervals and continued for several months. Sellei and Fenyo [18] reported satis-

13. Buie, L. A.: Treatment of Anal Pruritis by Ionization, Tr. Am. Proctol. Soc. **25**:148, 1925.

14. Oliver, E. L.: The Treatment of Pruritis Ani by Electric Ionization, Arch. Dermat. & Syph. **14**:560 (Nov.) 1926.

15. Whitfield, J. B.: Treatment of Lupus by Ionization, Lancet **1**:1026 (May 16) 1925.

16. Wirz, F.: Iontophoresis in Actinoymcosis, München. med. Wchnschr. **72**: 936, 1925.

17. Sladkowitsch, S. E.: Treatment of Lupus Erythematosus by Iontophoresis, Arch. f. Dermat. u. Syph. **152**:353, 1926.

18. Sellei, J., and Fenyo, J.: Iontophoresis in Dermatology, Med. Klin. **20**: 1078 (Aug. 3) 1924.

factory results in sycosis coccigenicus, trichophytosis profunda, alopecia areata, areas of telangiectasia and in local anesthesia. In tineal infections of the scalp and beard, marked improvement following treatment was shown at the start, but the infection usually persisted about a few hairs, causing a later relapse. Jones [19] recommended ionization of magnesium sulphate in the treatment for verruca vulgaris. Bourguignon [20] highly recommended ionization with the negative pole (iodine) for keloidal scars of all types, stating, however, that scleroderma was not affected. Fields,[21] in a recent preliminary report, recommended the method in pruritus ani and vulvae, alopecia areata and possibly dermatophytosis.

With these reports in mind, I have attempted to use the method in a few groups of cases. My experience in each group has been limited to a small number of cases and cannot therefore be conclusive. I offer them as a preliminary report. The group includes five cases of coccigenic sycosis, two cases of dermatitis papillaris capillitii, two cases of the discoid type of lupus erythematosus, six cases of pruritus ani, two cases of pruritus vulvae, two cases of verruca and some personal experiences with local anesthesia.

General Technic.—A wall plate containing a rheostat and milliamperemeter connected directly to the city supply of direct current was employed. The milliamperage and the voltage were controlled by the rheostat. A sheet of tin, 8 by 10 in. (20 by 25 cm.), was used for the inactive electrode and was separated from direct contact with the skin by gauze or hand towels saturated with a physiologic solution of sodium chloride. These must be of sufficient thickness to prevent chemical burns (from 6 to 8 layers of toweling). This was usually applied to the back by having the patient strip to the waist and lie on it when resting on the treatment table. The active electrode consisted of gauze saturated with the particular medicament to be used, cut to the size of the area to be treated, placed in direct contact with the skin and overlaid with a sheet of tin slightly smaller than the gauze pad and attached to the terminal wire by a spring clip (good contact). The whole was then bound to the part with elastic web bandage. When sharply localized lesions are to be treated or lesions in difficult locations, an opening the size of the area to be treated may be cut in a piece of rubber tissue and fitted over the lesion, and the moistened gauze placed over the opening as described. More elegant electrodes may be purchased for this purpose, but while satisfactory for the inactive pole, they are seldom of the desired shape for the active electrode and when used once with a medication should be kept for the same drug. The poles should be checked occasionally to see that they are correct as marked, since they may be reversed by changing terminals, in plugging into city current (with most milliamperemeters the needle will swing toward the positive pole).

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19. Jones, H. L.: The Treatment of Corns and Warts by Ionization, Brit. M. J. **2**:938, 1913.

20. Bourguignon, G.: Iontophoresis in the Treatment of Deforming or Adherent Scars, Paris méd. **2**:515 (Dec. 20) 1924.

21. Fields, R.: Ionization in the Treatment of Skin Diseases, Virginia M. Monthly **56**:613 (Dec.) 1929.

The solutions employed should be highly dissociated, i. e., diluted to from 1 to 2 per cent strength (compound solution of iodine was diluted from five to twenty times, depending on the sensitivity of the skin and mucous membranes), and a milliamperage as high as from 2 to 3 milliamperes per square centimeter of active electrode attained, the tolerance of the patient being used as a guide. Ionization was continued for from ten to twenty minutes, the milliamperage being advanced slowly as the tolerance increased. Connections should be solid to prevent sudden interruption of the current with the ensuing shock, and when the seance is completed, the current should be reduced nearly as slowly as it was advanced.

When a good electrolyte is used, the milliamperage usually increases slowly without advancing the rheostat. This is probably due to saturation of the skin with the electrolyte, and the ensuing increased conductivity. I believe that it is advisable, when permissible, to scrub the area to be subjected to ionization with soap and water or to apply moist compresses prior to ionization. In using certain heavy metals that are precipitated on or in the skin, the milliamperage may drop slowly, showing that the conductivity of the skin is being interfered with.

Coccigenic Sycosis.—Five patients with this condition were treated as follows:

Case 1.—B. R., aged 29, had had coccigenic sycosis of the right side of face for eighteen months. He had had the usual types of treatment, except that with the x-rays, without improvement, before reporting to me. Under my direction, treatment with the x-rays, the ultraviolet lamp, vaccines, antiseptic and stimulating ointments, manganese butyrate, tin oxides, etc., worked no improvement in one year. There was some extension to the left side of the face. I began ionization with compound solution of iodine (negative electrode) on Aug. 29, 1929. and repeated the ionization at intervals of from three to seven days until Oct. 10, 1929 (eleven treatments). In addition, treatment with the ultraviolet lamp, an ointment of balsam of peru and sulphur was continued. Rapid improvement was noted from the start, and at the time of the last visit the patient was seemingly cured. I have been unable to get in touch with him since, and he has probably left the city because of business depression. Therefore, the ultimate result is unknown.

Case 2.—R. W., aged 31, had an involvement of the upper lip and chin of ten months' duration. The nose and sinuses were free from infection. The patient was unable to obtain work because of his appearance. The usual treatments instituted by other physicians whom he consulted brought no improvement. I began treatment as in case 1, in conjunction with the use of the ultraviolet lamp and sulphur ointment, Nov. 1, 1929, and continued the treatment until Jan. 3, 1930 (fourteen treatments). He was then dismissed as well. I saw him again on Feb. 20, 1930, and he was still free from recurrence.

Case 3.—J. M., aged 36, showed involvement of the chin only. The disease had had a duration of six months. There was no response to the usual treatment, including fractional doses of the x-rays. Ionization with compound solution of iodine was begun on Jan. 2, 1930, and continued until Feb. 7, 1930 (twelve treatments), after which the patient was dismissed as well. In this case, calamine lotion was used immediately after treatment for twenty-four hours and then 5 per cent ammoniated mercury ointment. At two treatments, a physiologic solution of sodium chloride was used with the positive pole (Jan. 5 and Jan. 17, 1930), but there was seemingly a slight flare-up after each treatment, and there-

fore treatment with compound solution of iodine was resumed. The patient was checked two weeks after dismissal and was still free from recurrence.

CASE 4.—S. Z., aged 30, presented a slight involvement of the chin and adjacent areas of the cheeks. He had had this for six weeks. No previous treatment had been given. Ionization was begun on Jan. 6, 1930, and was repeated at four day intervals for three treatments. The ultraviolet lamp, calamine lotion and 5 per cent ammoniated mercury ointment were used conjointly, as in case 3. At the time of the last treatment, no lesions were to be seen, and the patient has not been seen since.

CASE 5.—A. N., aged 34, had had an involvement of the entire bearded region, most marked on the upper lip and chin, for nine months. There was a questionable infection of the right antrum. Previous local treatment had been of no avail. Ionization was begun on Feb. 12, 1930. Compound solution of iodine (negative electrode) was used on the upper lip and chin, zinc sulphate (positive electrode) on the right cheek and a physiologic solution of sodium chloride (negative electrode) on the left cheek. Boric acid ointment alone was used locally. (This patient is still under treatment, and the results will be reported in the discussion of this paper.)

Comment.—It would appear that ionization with compound solution of iodine is an effective treatment for coccigenic sycosis. In four of five cases for which this treatment was employed, the skin cleared up completely, although further observation is advisable before the patients are classed as cured. In all except one early case, various types of local treatment were tried, with little or no response. One case is still under observation. Other types of drugs may be equally effective, or the result may be largely due to the physical and chemical properties of the current itself. This will receive further comment in my discussion.

Dermatitis Papillaris Capillitii.—Only two cases of this condition, so rebellious to treatment, have come under my observation during the time of this study.

CASE 1.—C. S., aged 33, had had dermatitis papillaris capillitii for four years. He showed a typical keloidal mass ¾ by 3 in. (1.9 by 7.5 cm.) on the back of the neck, with scattered pustules. He has been under my care since October, 1927. He was treated with fractional doses of the x-rays at weekly intervals until fifteen treatments had been received, in conjunction with 5 per cent ammoniated mercury ointment and vaccine. He showed no improvement. Then he was treated at intevals with the ultraviolet lamp, manganese butyrate, tin oxides and various local applications. Ionization was begun on Aug. 30, 1929, in conjunction with the ultraviolet lamp and 10 per cent balsam of peru and sulphur ointment, applied locally. The patient was much improved after three treatments, and disappeared from observation for three months. He returned on Dec. 30, 1929, with the condition much as it was before. To Feb. 24, 1930, he had had ten treatments, with only about 50 per cent improvement. A change to zinc sulphate 1 per cent solution was made with the last three treatments, plus electrolysis with a platinum needle as the positive electrode. I believe that the electrolysis helped, but would classify the result as unsatisfactory.

CASE 2.—M. C., aged 29, had had a mild type of the disease, with scattered small keloidal papules, for a period of three years. Treatment was begun on Jan. 6, 1930, with ionization, as in case 1. Electrolysis of papules was also carried out occasionally, when I thought it was indicated. He had eight treatments to Feb. 24, 1930. At this time, he was seemingly well. I ascribe the good result largely to the fact that the eruption was of mild character and to the conjoint use of electrolysis on the keloidal papules.

Comment.—Experience in only two cases is hardly sufficient to enable one to pass judgment on this method of treatment. Although the treatment is of some value, it would seem to be ineffective in well established cases, when used alone.

Lupus Erythematosus.—I feel that one can be much more enthusiastic over the results of treatment in lupus erythematosus since the introduction of gold into the therapy, and that any value that might be established for ionization would be limited to its use on patients who were either resistant or reactive to gold therapy, and to its use on small early patches in cases in which one hesitated to employ the drug for fear of a toxic reaction.

CASE 1.—A. S., aged 37, presented a classic example of the discoid type, of six years' duration, involving the bridge of the nose and the upper part of the right cheek. He had had various types of treatment in the past, including that with carbon dioxide snow, with recurrence. I treated the patient with ionization, using quinine hydrochloride in 1 per cent solution on the positive pole. The treatment was given twice weekly for four weeks, without improvement in the condition, and was therefore discontinued for gold and sodium thiosulphate, administered intravenously.

CASE 2.—T. P., aged 31, had a typical patch 1 inch (2.5 cm.) in diameter on the right cheek near the ear, of a year's duration. Treatment was begun with quinine ionization on Jan. 18, 1930. On Feb. 7, 1930, five treatments had been given, without result. A change was made to gold and sodium thiosulphate in 1 per cent solution on the positive pole. Four treatments have been given since Feb. 2, 1930. There has been some improvement, as shown by less infiltration, less scaling and a decided paling from the bright, erythematous red. There has been no evidence of gold pigmentation of the skin.

Comment.—In two cases of lupus erythematosus, I was unable to secure any improvement by ionization with quinine, although it is admitted that I may probably have been too readily discouraged. In one case that is still under observation, I believe that a decided improvement has resulted from ionization with gold and sodium thiosulphate.

Pruritus Ani and Vulvae.—I have treated six patients with pruritus ani and two with pruritus vulvae in a period of several years. In general, my results are in agreement with those of Oliver:[14] an excellent result in two cases, marked improvement in two cases and failure in two cases. In pruritus vulvae, an excellent result was secured in one case, and in the other, the patient discontinued treatment, evidently dissatisfied.

Verruca.—I have treated one patient with plantar and one with palmar wart by means of ionization, using magnesium sulphate solution with the positive pole. After giving four treatments in each case, without seeing improvement, I felt that the method was too slow and time-consuming to warrant further trial, especially with deep-seated keratotic lesions.

Local Anesthesia.—The use of ionization for the introduction of local anesthesia is frequently mentioned in the literature. Wirz [22] reviewed the subject and stated that from his experience cocaine gives much better results than any of its less toxic substitutes. He tried various solvents and, contrary to what might be expected, found 80 per cent alcohol to be the most satisfactory.

I have found 2 per cent cocaine hydrochloride in 80 per cent alcohol satisfactory for the induction of local anesthesia in the skin. A rather marked erythema is induced, with some edema, accompanied by a burning and tingling sensation. The erythema may persist for several days, to be followed by a rather persistent brown pigmentation. For this reason, the method is suitable only for those patients who are unusually "needle shy," and then should be confined to small areas. The amount of reaction may be kept at a minimum by the use of the smallest amount and duration of current consistent with the depth of anesthesia desired. I have found 1 ma. per square centimeter acting for five and at the most ten minutes sufficient for minor dermatologic operations. An opening the exact size of the area to be treated should be cut in a piece of rubber tissue and fitted over the lesion. The gauze saturated with the cocaine solution and the positive electrode are then placed over the opening.

The anesthesia of the skin is complete for tactile sensation and pain. The deeper nerve trunks are not affected, nor is pressure sensation. The anesthesia extends about ⅛ in. (0.31 cm.) beyond the area anesthetized, and is bordered by a band of slight hyperesthesia. With the use of the aforementioned solution, anesthesia lasts for from four to eight hours, disappearing first in the border and last in the center of the area treated. This is in agreement with Wirz, although the duration is a disputed point. The duration probably depends on the type of solution used; the authors who claimed that the anesthesia was transitory were probably using an aqueous solution, which produces unsatisfactory results. I may also state that when cocaine is used on the negative electrode instead of the positive, not the slightest anesthesia results.

22. Wirz, F.: Anaesthesia by Iontophoresis, München. med. Wchnschr. **71**: 425 (April 4) 1924.

COMMENT

So many factors are to be considered under the head of "treatment by ionization" that its explanation becomes complicated. The laws for simple electrolytes, as has been seen, are not applicable to ionic medication in man, and the more one attempts simple explanations the more involved the problem becomes. Much cannot yet be explained.

In the experimental work outlined, two contradictory observations were made. On the one hand, anesthesia was induced in the skin with rather small milliamperage in as short a time as five minutes, which undoubtedly means that penetration is rapid; on the other hand, it was demonstrated physically that penetration is slow. One easily becomes enthusiastic when the results with cocaine alone are considered as proof of penetration; as easily pessimistic if the results with zinc, silver or lead are considered. In other words, certain drugs (cocaine, epinephrine, iodine, ferrous sulphate, etc.) penetrate rather readily, and others (zinc, lead, ferric sulphate, silver, etc.) are precipitated on the surface and their effects are purely local. One needs to know more about the penetration of the ions of more drugs. Why, for instance, do the ions of ferrous salts penetrate moderately well, while those of the ferric salts penetrate poorly, if at all? As shown by variations in the efficiency of cocaine for anesthesia, one needs to know more about suitable solvents for each drug, as well as the activity of each in ionic form.

Cocaine has properties which permit its absorption unaided through mucous membranes. It is probably this faculty that permits its ready absorption through the skin when given some aid by an electric current. Epinephrine, which has been reported as being readily absorbed in ionic form, has similar properties. Certain authors have stressed the fact that ionic anesthesia is much more persistent than that induced by hyperdermic injection as proof that ionic medication penetrates cell membranes and is therefore the most effective form of medication. I feel that the persistence of anesthesia may be due directly to the current, which produces prolonged edema in the part, resulting in delayed absorption.

I suspect that drugs under the influence of the galvanic current penetrate more readily through the inflamed than through the normal skin; that in coccigenic sycosis, for instance, the main portal of entry for the current is through the active pustules, thus rendering these points subject to intensive current, as well as medication, and that the good results reported in a few cases of lupus vulgaris are due to the caustic effect of zinc sulphate with a natural selection of the apple jelly nodules as the points of maximum intensity.

The question of the effects of the drug, in contradistinction to those of the current itself, is difficult. I am treating patients with the current

alone (using sodium chloride as an electrolyte) to test this point. I believe that the effects of the current may at least be fortified with proper selection of drugs, although I doubt that they should be given undisputed credit for results that may be secured.

Besides the physical and chemical properties of the two poles of a galvanic current, as already listed, there are certain effects on the tissues that play an important rôle in any therapeutic results secured. The passage of the current has a stimulating effect. There is irritation of the skin under the pads (most marked at the negative pole), evident both from the sensations of the patient and from the presence of hyperemia when the pads are removed. This, then, is another means of producing the ordinary counterirritant effect so valuable in chronic inflammations.

Finzi [5] showed that tissue stained after being subjected to the chemical action of the negative pole (H ions) had an increased affinity for basic stains; that tissue stained after being subjected to the chemical action of the positive pole (OH ions) failed to take basic stains. The effect persisted for as long as two days, even in the living animal. Confirmation of this point was noticed in the staining of sections of skin as previously described. In other words, there is the question of hydrogen ion concentration, so enticing to modern physiologists. One can evidently alter the hydrogen ion concentration of the living tissues in a rather persistent manner by the galvanic current, and this phase of the study would bear further investigation.

Another interesting speculation is the effect of the galvanic current on the osmosis of the living cell (cataphoresis).

According to Turrell,[10] the therapeutic effect of the galvanic current is due simply to the heat generated in the tissues and the increased functional activity from the bombardment of the tissue cells. I have been unable to demonstrate that sufficient heat is produced, by currents of such low potential, as to be a factor in therapeutic results. By applying the pads used in treatment and leaving them in place long enough for their temperature to approach that of the normal skin and then proceeding with the treatment, I have observed no appreciable rise in the temperature of the skin (as registered by a clinical thermometer under the pad) at either pole, as compared with a control pad not subject to the current. Temperatures in no case higher than 97.4 F. were recorded, although it is admitted that the method was rather crude and that evaporation from the pads would tend to reduce the actual temperature of the skin, when so taken.

In my opinion, treatment by ionization is worthy of further investigation and clinical trial, if the limitations enumerated throughout this paper are borne in mind. I am anxious to try it in resistant cases of blastomycosis and actinomycosis, as well as the cases already enumerated,

at the same time endeavoring to analyze further the effect of drug and current. The results reported in alopecia areata are probably largely due to the current and its counterirritant effects rather than to the drug employed. They would seemingly be more readily obtained by other more easily applied methods. I find no reference to its use in thrush of the leukoplakial type on the mucous membranes, nor in dermatitis repens, in which it may be of value.

Until one can answer specifically more of the questions enumerated, the use of ionization will be largely on an empiric basis and therefore unsatisfactory. Yet much of present physical therapy is empiric, including the use of the x-rays. It behooves one to be conservative in judging clinical results with ionization and especially the method of action.

SUMMARY AND CONCLUSIONS

The general principles of ionization in therapy are reviewed, as well as the experimental work on this subject. It is generally accepted that, in life, drugs cannot be driven deeper than the subcutaneous tissue.

Experiments performed with the use of physical solutions showed that:

The rate of penetration of ions varies directly as the voltage.

Various ions travel at different speeds.

The rate of penetration in physical solutions and tissue is surprisingly slow.

An endeavor has been made to show the path followed by drugs under the influence of the galvanic current in their penetration of the epidermis. The assumption that the sweat ducts are important portals of entry has been strengthened, but not proved. A portion of the current may penetrate directly through the epidermis to the nearest papillae.

The literature has been reviewed for clinical reports of the use of ionization in dermatology. It has been used in practically all types of chronic infections of the skin.

Five cases of coccigenic sycosis have been reported, in four of which a rather prompt and satisfactory response has been obtained by treatment with ionization of compound solution of iodine. The cases have not been observed long enough to ensure against relapse. In the fifth, a recent case, treatment is still being given.

In two cases of dermatitis papillaris capillitii, the response could not be classed as satisfactory.

In more than half of six cases of pruritus ani and two of pruritus vulvae, from excellent to good results were secured.

Two cases of verruca failed to respond.

Two cases of lupus erythematosus failed to respond to treatment by ionization of quinine, although one is seemingly responding well to that by ionization of gold and sodium thiosulphate.

Satisfactory anesthesia for dermatologic surgical procedures may be secured by the use of ionization with cocaine, but persistent erythema and pigmentation render the method of little practical value.

The question of the mode of action of ionization and its indications in dermatology is discussed. The action of the current itself is of as much, and in some conditions of more value than that of the drugs used.

ABSTRACT OF DISCUSSION

DR. HOWARD FOX, New York: Dr. Shaffer has given us an excellent review of the theory of ionization and an account of his experimental investigations. I was especially pleased with his conservatism in saying that ionization does not deserve consideration when simpler methods are equally reliable. I agree with him that no matter how time-consuming the method may be, it is worthy of trial if good results are attainable in some specially resistant dermatosis. Of these, pruritus and especially coccigenic sycosis are of prime importance. From the work of Field in my office and clinic on pruritus ani and vulvae, I became convinced that in certain of these cases of unknown etiology, when roentgen irradiation had failed or had been given to the limit of safety, treatment by ionization was well worth a trial. Field's results were similar to those of Oliver, some being excellent, some fair and others bad. The speaker's results in that most obstinate disease, sycosis, should encourage some of us to try this method of treatment, which is so little used, at least in America.

DR. JOSEPH GRINDON, St. Louis: If my memory serves me it was in the early nineties that Adamkiewicz recommended the use of the electric current in the treatment for ringworm and allied infections. He did not call it ionization, but used the word "cataphoresis," which I think is now used in a more limited sense. I employed the method at that time, but, perhaps owing to the fact that my galvanic outfit was of primitive type, I got no results.

As to the difficulty of formed ions through the epiderm, it is known that the resistance is almost entirely in the stratum corneum. In experiments with the living subject or cadaver, when the stratum corneum has been removed from the areas of contact there is a drop in resistance to practically nothing. One of the symptoms of exophthalmic goiter is that electric resistance is very low, probably because the attendant perspiration has soaked the stratum corneum, thus making it a better conductor.

DR. PAUL A. O'LEARY, Rochester, Minn.: My experience with ionization has been limited to the treatment for pruritus vulvae and ani, and its use as a therapeutic agent has been carried on in conjunction with a proctologist. In patients in whom an inguinal dermatophytosis was ruled out, vaccine therapy used unsuccessfully and roentgen therapy tried to the point of intolerance, ionization was occasionally of value. No doubt, the psychic factor played a rôle in these cases, particularly in the cases of pruritus vulvae with no evidence of dermatitis.

DR. JOHN H. STOKES, Philadelphia: I wish to ask Dr. Shaffer a question. I came up through the ranks, assisting a distinguished man in bearing the burden of a heavy practice, and the fate of such a person is to remove feminine beards. I did this, and in the course of treating these patients over a long period of time

it seemed to me I observed this particular thing: When starting a seance the first hairs appeared to come out very easily; as I went along, although the entry to the follicle seemed to be as satisfactory, it seemed to require more current and I frequently had to step the rheostat up, and the patients complained of pain. This increased resistance of the skin impressed me over and over again, and I wonder whether Dr. Shaffer has any explanation as to its possible mechanism.

There is no need to apologize for this type of paper. The man who has had the courage to go through this arduous study, which requires a great deal of effort, should be commended, and it is too bad that the paper could not have been read when cataphoresis first enjoyed its popularity.

Dr. Loren W. Shaffer, Detroit: I wish to thank you for the kind reception of my paper. There are two things which I mentioned in the paper that I wish to add to this discussion. In one case I was trying to determine the specific action of the drug itself in coccigenic sycosis and used a physiologic solution of sodium chloride on one cheek, zinc sulphate on the chin and lip and compound solution of iodine on the other cheek. Unfortunately, the patient discontinued treatment at about that time, and no opportunity for comparing results was secured. Another interesting thing was the relation of gold sodium thiosulphate to ionization. In one case, which I spoke of as being improved a certain amount and then becoming resistant, I decided to try gold sodium thiosulphate intravenously and the patient blossomed out with a generalized toxic dermatitis, such as was discussed this morning, after a single injection of 30 mg. I wonder whether that was not an example of a gold compound acting as an intradermal sensitizing agent to that drug. You noticed that most of the severe reactions have occurred following a second injection, not the first, proving not a pure idiosyncrasy on the patient's part but more probably a sensitization developed by the first injection.

In the treatment for ringworm the method has been used quite extensively but has been practically given up so far as ringworm of the beard or scalp is concerned. Although there is some improvement, isolated areas escape and recurrence is the rule.

In answer to Dr. Stokes' question, there is a current of reverse polarity induced by a constant current flowing through the tissues that tends to reduce the amount of the primary current. This is readily demonstrated by the milliampere meter; when the current is shut off, the needle swings past the zero point, showing discharge of a current of opposite polarity. The other factors causing a decrease in the current are physical ones due to drying of the electrodes of the pad, and, with certain medication, to precipitation on the surface interfering with the passage of the current.

TUBERCULOSIS OF THE SKIN

HISTOLOGIC CONSIDERATION *

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To establish a histologic diagnosis of any one of the many clinical forms of tuberculosis of the skin, the tubercle must be present. When the tubercle is absent, other fields of investigation, such as the bacteriologic, serologic and biologic, must be employed to arrive at a diagnosis. When the tubercle is present, these methods should be employed to substantiate the histologic diagnosis.

The tubercle in dermal pathology is different from that of general pathology. It is composed of a group or nest of epithelioid cells within a lymphatic space, no matter where the lymphatic vessel is located, whether it is in the cutis or the subcutis.

Giant cells, plasma cells or lymphocytes may be present, but are not essential to the structure of the tubercle. One or more giant cells may be within the tubercle or may be independent of it. The lymphocytes may surround the tubercles or may be in the cutis that is about the tubercles. Plasma cells may be within the lymphatic zone, in the perivascular lymph spaces or scattered throughout the cutis.

None of the cutis or subcutis connective tissue fibers are between the epithelioid cells. These fibers may form a sort of sheath or dense capsule about the tubercles.

The tubercles may be small or large, few or many, discrete or confluent, and located in any part of the cutis or subcutis. They may be limited to these zones but are seldom present in both, except by direct extension.

The tubercles may be accompanied by an exudative or productive nonspecific inflammatory process of variable intensity and may or may not be affected by it. When affected, the epithelioid cells are separated either by fluid or by other cells that wander in between them, to such a degree as to mask the real architecture of the tubercle; at times, it is difficult to identify them as such.

Necrosis of the epithelioid cells and of the surrounding zones and either physical or tinctorial degeneration of the connective tissue may result as sequelae of the inflammatory process.

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* From the Dermatological Department of the New York Post-Graduate Medical School and Hospital, George M. MacKee, director.

If the tubercles are located high up in the cutis or if the inflammatory process is marked, the epidermis may be thinned either by pressure or by tension. The epidermis may be thickened, owing to either edema or irregular acanthosis. The acanthosis may involve the epidermis proper or the follicle walls, resulting in considerable distortion, even to plugging up of the follicular orifices. Abscesses may develop in these plugged follicles and may rupture into the cutis proper.

Independent of the tubercle formation and of the inflammatory process, granulation tissue may develop. This may surround the tubercle zone or may be entirely apart from it. In the granulation tissue there are variable numbers of usually thin-walled vessels or capillaries with plasma cells either in the perivascular lymphatic spaces or in the vicinity of the vessels. Fibroblasts and connective tissue fibers are also present. Elastic tissue fibers are usually absent.

A characteristic feature of the tubercle is the absence of vessels as a component part of its architecture. Some writers report the development of tubercles about vessels as characteristic. I have not found this to be so in the tissues that I have studied. The tubercles may enlarge and encroach on vessels or the tubercles may clump and in so doing compromise vessels; I consider these as incidents and not as basic changes.

HISTOLOGIC FEATURES

The histologic features of tuberculosis of the skin vary according to the clinical status, during evolution or involution, or as the results of secondary processes. In spite of the very many clinical pictures, histologically they can be arranged as follows:

GROUP 1.—*Tubercles Without Any Other Pathologic Process.*—The tubercles may be few or many, of variable sizes, isolated or grouped as to compose distinct masses, and occur in any part of the cutis or subcutis, but are seldom primary in both. The cutis type seldom extends into the subcutis, but the subcutis type may extend into the deep cutis.

Giant cells may be present, but plasma cells and lymphocytes are usually absent. Usually large numbers of giant cells are present in the subcutis type.

The collagen bundles are not affected in any way except that of pressure from the tubercle mass. The epidermis may be thinned by pressure, but it is seldom eroded.

The tubercles rarely show any tendency to break down, nor is there any degeneration either of the cutis framework or of the vessel walls.

GROUP 2.—*Tubercles Accompanied by a Nonspecific Inflammatory Process.*—The inflammatory process may vary in intensity, and any one of the cardinal features (congestion, edema, cell infiltration) may predominate.

If the congestion is marked and the process is of some duration, blood cells and pigment are usually noted in the cutis.

If the edema predominates, the cutis framework is converted into a loose network, and the epithelioid cells become separated from one another. Lymphocytes are usually present between the epithelioid cells and in the edematous cutis. The tubercle plus the inflammatory reaction is a diffuse process, and no sharp margin of the tubercles is present. Unna called this condition lupus diffusus radians. (This is a histologic term and has no clinical application).

The congestion and the edema may not be as marked as the cellular infiltration. This is predominately lymphocytic, but a few scattered plasma cells may be present. The lymphocytes surround the tubercles as distinct mantles, and the inflammatory edema is usually not of sufficient intensity to disturb the architecture of the tubercles. Unna called this condition lupus miliaris circumscriptus (histologic term).

Secondary changes due to the inflammatory process may also be present. Granular necrosis of the epithelioid cells and infiltration cells may occur. The edematous collagen fibers or bundles may undergo degenerations, such as granular, collastin or hyaline. In the necrotic portions there are the remnants of fibers, broken down cellular elements and varying numbers of polymorphonuclear leukocytes.

In the discussion of necrosis, Lewandowsky and others found that this may be the result of vessel changes or that it may be primary in the vessel walls, and that usually around this necrotic zone tubercles and tuberculoid structures were present. In some of my cases of papulo-necrotic tuberculids and erythema induration of Bazin, necrosis of the vessel walls and of the cellular infiltration about the vessels was found, but no evidence or even remnants of either tubercles or tuberculoid structures.

The epidermis may present changes similar to those noted in long-standing eczematoid processes such as spongiosus with or without vesicle or pustule formation, with parakeratosis or hyperkeratosis. Acanthosis, with or without hyperkeratosis, with or without secondary changes due to edema, may be a marked feature. The acanthosis may be markedly irregular, even verrucous. These epidermic changes are not characteristic of tuberculosis, nor have they any relation to the tubercle formation; they are the results of the accompanying inflammatory process.

If the tubercle plus the inflammatory process occurs in the subcutis, the cutis changes may be slight. They are marked only when the degeneration or breaking down process occurs in the subcutis; they may even take part in the degeneration or breaking down process, and ulceration may result.

At times the inflammatory process is the predominant feature. Lewandowsky stated that when the tubercle bacilli multiply in great

numbers, the tissue response is a nonspecific inflammatory process, and that when the organisms persist in their activity in the presence of antibodies, tubercles or tuberculoid structures develop.

When the inflammatory reaction is the only response, a histologic diagnosis of tuberculosis is not possible. The organisms must be demonstrated to establish the diagnosis. This is not always feasible, and at times almost impossible. The demonstration of tubercle bacilli in tuberculous tissue is a time-consuming process. Many hundreds of sections may have to be examined, and the organisms are not always found. The results of animal inoculation are not always positive. A negative examination of tissue and a negative reaction to animal inoculation does not always rule out tuberculosis.

The response to injections of tuberculin are not conclusive. The patient may have a tuberculous focus in tissues other than the skin. The response may be negative, and the test may have to be repeated at various times.

The results of therapy are not always of diagnostic value. The general condition of the patient in many different types of disease process may improve from similar therapy.

GROUP 3.—*Tubercles Accompanied by Inflammatory Process Plus the Development of Granulation Tissue.*—This may occur in any part of the cutis or subcutis. The granulation tissue may be the predominant feature. It may occur independent of either the tubercle formation or the inflammatory process. It may surround the tubercle zone, and at times only remnants of the tubercle are present.

When ulceration results from the degeneration or necrosis of the affected zones, granulation tissue readily develops on the floor and sides of the ulcerated area. Tubercles are seldom, if ever, present in the floor or sides of the ulcerated areas.

If portions of the open lesion are examined microscopically, a diagnosis of granulation tissue, characteristic of no one special disease, is the only one possible. It makes little difference what etiologic factors underlie the ulceration, granulation tissue may develop. This may be noted in tuberculosis, syphilis, leprosy, blastomycosis, granuloma inguinale, chronic dermatitis, radiodermatitis and even in malignant processes. Unless tubercles are present somewhere in the tissue examined, a diagnosis of tuberculosis cannot be entertained.

CLINICAL APPLICATION OF THE HISTOLOGIC EVIDENCE

The histologic evidence may not always correspond to the clinical diagnosis, and it is not possible to make a definite clinical diagnosis from the histologic picture. The histologic evidence must be correlated by the clinician.

As before mentioned, the microscopic picture varies according to the stage of the disease and the influences of secondary process. This may explain why so many different clinical names have been given to similar clinical processes in which different histologic changes were noted.

Tubercles Without any Other Pathologic Process.—When the tubercle formation is primary in the cutis, the tubercles may be limited to the upper, middle or deep zones or may be scattered throughout the cutis, but they rarely occupy the entire cutis. This is noted in sarcoid of Boeck, miliary lupoid and granuloma annulare.

When the tubercle formation is primary in the subcutis, at times the tubercles may extend upward into the deep cutis. Usually, the formation consists of confluent tubercles forming a dense mass extending down into the deep fat. Occasionally, only scattered tubercles, hardly enough to account for the clinical picture, are present, as noted in the sarcoid of Darier-Roussy. At times, some types of lupus vulgaris, erythema induratum of Bazin and lupus pernio of Besnier simulate the deep type of sarcoid. The clinical history, the onset, the evolution and course, location, age, sex and other fields of investigation assist in the differential diagnosis.

Tubercles Plus Inflammatory Process.—In the superficial condition, without necrosis, the tubercle formation is in the papillary zone, and the inflammatory process is usually very moderate. Some writers report these tubercles arranged about the papillary vessels. This was not so in my specimens. Clinically, lichen scrofulosorum and reported cases of early lichen nitidus belong in this group. (In my specimens of lichen nitidus I found a nonspecific inflammatory process, nothing suggestive of tubercle formation.)

In superficial conditions with necrosis, the tubercle formation is in a similar location, as in old lesions of lichen nitidus. (I did not find this in any of my specimens.)

Tubercle formation with an inflammatory process may appear in any or all parts of the cutis without necrosis or degeneration or secondary infection, as noted in lupus vulgaris, lupus miliaris, lupus faciei and follicularis disseminatus of Tilbury Fox. At times the process appears to be related to the pilosebaceous apparatus or coil glands. Whether the process begins in these zones or is an accidental development of the tubercle formation is impossible to state from the histologic picture.

Necrosis may occur in the central portion of the process, as noted in some types of lupus vulgaris, folliclis exulcerans of Jadassohn, acnitis of Barthelemy and acne telangiectodes of Kaposi. There are very little differences in these clinical processes, histologically.

Tubercles plus an inflammatory process with or without necrosis in the subcutis occurs in some types of lupus vulgaris and in erythema induratum of Bazin.

When the congestion and the edema are marked features, the clinical appearance may suggest lupus erythematosus or colloid degeneration.

In many of my cases of papulonecrotic tuberculid I found in the cutis, an inflammatory process with necrosis as the predominant feature without any suggestion of tubercle formation. In a number of cases clinically diagnosed Bazin's disease, a similar process was found in the deep cutis, without any tubercle formation. My observations correspond to those reported under periphlebitis nodularis necroticans. Whether these papulonecrotic tuberculids and the periphlebitis necroticans are of tuberculous origin, I am not prepared to state at the present time.

Tubercles Plus Inflammatory Process Plus Granulation Tissue.—Tubercle formation without ulceration but with marked changes in the epidermis is noted in tuberculosis verrucosus cutis and anatomic tubercle. Tubercle formation with marked granulation tissue or proliferated connective tissue is found in hypertrophic forms of either lupus vulgaris or tuberculosis cutis. In some forms of lupus vulgaris, erythema induratum and scrofuloderma tubercle formation with necrosis either of the cutis or subcutis with ulceration is seen.

RÉSUMÉ

The clinical appearance of tuberculosis of the skin varies according to the predominance and histologic location of the tubercles, the inflammatory process and the granulation tissue, or any of the secondary changes, such as hypertrophy or hyperplasia of either the collagen or epidermis, or finally, as the result of degeneration, necrosis or ulceration of the affected parts:

Tubercles only
- In the cutis: sarcoids of Boeck, miliary lupoid or granuloma annulare
- In the subcutis: sarcoids of Darier Roussey; at times, lupus vulgaris, erythema induratum, lupus pernio

Tubercles plus nonspecific inflammatory reaction
- Superficial: lichen scrofulosorum, lichen nitidus
- In any part of the cutis: lupus vulgaris, disseminated nodular tuberculosis, folliclis
- In the subcutis: lupus vulgaris, erythema induratum
- When the edema is pronounced: lupus tumidans
- With necrosis: lupus vulgaris, acnitis, old lesions of lichen nitidus, erythema induratum

Tubercles plus inflammatory process plus granulation tissue
- With marked epithelial changes: as seen in verrucous tuberculosis

With marked proliferation of the connective tissue: as seen in hypertrophic tuberculosis

In the subcutis, with or without involvement of the cutis with or without ulceration: Bazin's disease

In the subcutis with ulceration and sinus formation: as seen in scrofuloderma

From the foregoing consideration, one can readily understand that a clinical diagnosis as to the type of tuberculosis present is not easy from the microscopic picture. The pathologist can report only what the pathologic changes are, and it is for the clinician, who has all the other data, to correlate these changes and to establish the clinical form of tuberculosis.

ABSTRACT OF DISCUSSION

Dr. H. E. Michelson, Minneapolis: The subject of tuberculosis of the skin is so tremendous and one's individual experience so small that I hesitate to open this discussion. To ignore entirely the value of histology in differential diagnosis would be to ignore the splendid work of such men as Besnier, Jadassohn, Lewandowski, Volk and others. I may be at variance with the essayist, or I may be wrong in interpreting some of his statements. I heartily agree that one should not attempt to make a microscopic differentiation alone as to the type of tuberculosis, but that the history, the clinical lesion, the degree of immunity and the microscopic picture should all be taken into consideration. I think that it is best to do as Dr. Ormsby pointed out yesterday — to make a clinical diagnosis of tuberculosis if possible and then, after a careful study from every angle, to try to determine the exact type. On the other hand, I think that one should not ignore the great value of histology in determining the particular tissues involved, the type of cytology and whether or not necrosis is present. Tuberculosis of the skin is usually a manifestation of systemic tuberculosis, and the histology is the connecting link. In the main, histology should assist in placing the condition in one of at least three general headings: (1) classic tuberculosis of the skin, which includes lupus vulgaris and which is a more or less stable type; (2) the tuberculids, which are quite labile, and (3) the sarcoids or indurative type of tuberculosis.

Dr. Walter J. Highman, New York: I had the pleasure of discussing this paper with Dr. Satenstein on our way from New York and am glad that I did, for he was clearer then than in the paper this morning. That is not said in criticism, for he tried to express a great deal in a few words, and I know what delivering one's first paper before this body means.

I think that Dr. Satenstein made a mistake in not making his point as clear as he made it to me the other day, which is that the clinician wants the impossible from the histologist. He wants a diagnosis, and that is an absurdity. It is entirely up to the clinician to interpret what the histologist has to report. It is not the function of the histologist to lead the clinician by the hand and to show him what he should find for himself.

I do not see how Dr. Satenstein could make the dogmatic statements that he did in the paper. I think that the attempt to make the differentiation of the various types, as Dr. Satenstein did, is being too generous to the clinician. As Dr. Satenstein said, the tubercle is what indicates the point, and I think that all the pathologist can do is to report tuberculosis to the clinician and not to attempt anything more. I think that the histologist should not be expected to settle the clinical diagnosis. If histology is to be pursued intelligently, it must be pursued

in this way, unless the microscopist also sees the cases clinically. Otherwise, there is no reason for him to assume that the clinical label under which he receives the specimen is correct, any more than the clinician should expect that the histologist should report definitely to him in return.

I object to the term "diagnosis" as applied to the construction placed on the histologic slide. I think that a description is all that is necessary, and if this leads to the conclusion that tuberculosis can be recognized or leads to the belief that tuberculosis is present, that is all the clinician can expect.

Dr. William Allen Pusey, Chicago: I wish to say only that, to me, all that has been expressed by the discussers was very clearly the attitude of Dr. Satenstein.

Dr. Clark W. Finnerud, Chicago: I think that Dr. Satenstein was a little drastic or, rather, too sparing in his statements concerning the changes in the blood vessels in tuberculosis. In the blood vessels we often have one of the most important aids in the histologic diagnosis of certain forms of tuberculosis; particularly in the tuberculids do the blood vessels often show an architecture that is extremely characteristic, a good illustration of which is seen in erythema induratum.

Dr. Satenstein mentioned the fact that a tubercle is necessary to make an accurate histologic diagnosis of cutaneous tuberculosis. There is no question about that, but on the other hand, we should remember, as is well recognized, that the picture may be closely, even identically, simulated by numerous other conditions, such as deep nodular trichophytosis barbae, paraffinoma and numerous other disorders that might be mentioned as being capable of producing a marked foreign body reaction.

Dr. David L. Satenstein, New York: I think that the point Dr. Highman raised was practically the concluding remark of my communication.

As to the changes found in the deep cutis, I take those to be associated with the inflammatory reaction and to have nothing to do with the tuberculosis proper. This is seen in many conditions corrected with long-standing inflammatory conditions. The proliferative changes occur as the result of the long-continued irritation. I also made the remark in the opening part of my paper that all of the other tests should be made in those cases in which we find tubercules to corroborate the diagnosis, and in cases in which we do not find tubercles such tests are imperative if we wish to establish the diagnosis. I tried to cover all that ground and to show a few pictures to illustrate some of the points.

THE CLINICAL ASPECT OF SEROLOGIC DISCORD IN SYPHILIS *

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The clinical interpretation placed on comparative tests for syphilis varies. While the Wassermann test still holds the position of paramount importance, other tests such as the Kahn precipitation test and the Vernes flocculation test have been perfected.

The Wassermann test requires considerable outlay for workers and animals; besides, only well equipped laboratories can render reliable reports. The great amount of data accumulated over many years establishes its position as a test in syphilis. The delayed positive reaction in early syphilis, the poor results following the provocative procedure, the difficulty of determining the progress of treatment unless a tedious titration is resorted to, and the numerous technics employed are some of its faults. Anticomplementry reactions in doubtful cases are troublesome.

The Kahn test is the best known precipitation reaction for syphilis. It is simple to perform and economical, and it has many advocates. It is, however, relatively new, but considerable data has been collected with encouraging results. Persistent one plus reactions in cases of patients treated for a long time are difficult of clinical interpretation.

The Vernes flocculation test for syphilis is a colloidal reaction. The difference between the reaction tube and the control tube in degrees of flocculation as read on the photometer is the result which, if it is more than 5, is considered presumptive evidence of syphilis. The apparatus is expensive, and the preparation of perethynol is difficult.

In a previous study [1] the Wassermann test, the Vernes flocculation test and the Kahn Kline slide test were compared, and it was found that agreement existed in patients without syphilis. It was also shown that in patients with syphilis serologic discord was marked in latent and treated cases, whereas in early clinically active cases moderate agreement existed.

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* The laboratory examinations utilized in this paper were performed in the Department of the Laboratories of the New York Post-Graduate Medical School and Hospital.

1. Sheplar, A. E.; Lyons, M. A., and MacNeal, W. J.: Serological Discord in Latent and Treated Syphilis, Arch. Dermat. & Syph. **18**:742 (Nov.) 1928.

Serologic discord was noted in 300 Wassermann and Vernes tests.[2] The Wassermann test was found to be more sensitive than the Vernes flocculation test. The Vernes test was considered a helpful guide in the treatment of syphilis and could reveal changes in the amount of reagin more than necessary for complete complement fixation. In another article[3] these authors stated that according to Vernes 98 per cent of nonsyphilitic patients showed a reading of 0.02 mg. or less; 2 per cent from 0.02 to 0.04 mg.; 1 in 500 a reading of from 0.05 to 0.06 mg.; 1 in 2,000 a reading of from 0.07 to 0.11 mg., and a reading of 0.27 mg. was noted once in 650,000 nonsyphilitic cases. The Vernes flocculation test[4] evidently depends in part on special substances in the patient's blood. Of 758 nonsyphilitic patients studied,[5] the Vernes results were from 0 to 4 in 634; from 5 to 9 in 90; from 10 to 20 in 31, and from 21 to 24 in 3. In the syphilitic group, Cornwall[5] also found several instances of variations between the Wassermann and Vernes tests. This author stated that the Vernes flocculation test is especially useful to determine the effect of therapy.

Vernes[6] tabulates 2,355 comparative Wassermann, Vernes and Sachs Georgi tests on identical specimens of serum. There were 307 positive; 94 plus minus and 1,954 negative Wassermann reactions. The Vernes series showed 1,696 below 5; 235 from 5 to 10; 207 from 11 to 30 and 217 above 30. The Sachs Georgi series showed 1,874 negative; 67 one plus; 87 two plus; 72 three plus, and 255 four plus. The fluctuation of the Vernes test and its significance to treatment[7] was not considered in this present study.

Madsen and Mørch[8] reported results of 15 different serodiagnostic methods on the same specimen of serum and spinal fluid.

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2. Baylis, A. B.; Sheplar, A. E., and MacNeal, W. J.: Simultaneous Vernes and Wassermann Tests for Syphilis, Arch. Dermat. & Syph. **10**:306 (Sept.) 1924.

3. Baylis, A. B.; Sheplar, A. E., and MacNeal, W. J.: The Vernes Flocculation Test as an Accessory Serologic Guide in the Combat Against Syphilis, Am. J. Syph. **10**:298 (April) 1926.

4. Sheplar (footnote 1). Baylis, A. B.; Sheplar, A. E., and MacNeal, W. J.: The Vernes Flocculation Test for Syphilis, Arch. Dermat. & Syph. **12**:242 (Aug.) 1925.

5. Cornwall, L. H.: Further Experiences with the Vernes Test for the Diagnosis of Syphilis, J. Lab. & Clin. Med. **10**:831 (July) 1925.

6. Vernes, A.: La portée sociale de la mesure de l'infection syphilitique. Trav. et publ. de l'inst., prophylact., Paris, 1924, part 3. Vernes, A.: L'organisation de la syphilimetrie, Trav. et publ. de l'inst. prophylact., Paris, 1923, part 2.

7. Vernes, A.: Une serologie précise éclaire le traitment de la syphilis, Trav. et publ. de l'inst. prophylact., Paris, 1926, part 5.

8. Madsen, T., and Mørch, J. R.: Serodiagnosis of Syphilis (International Investigations Instituted by Committee on Hygeine of League of Nations). Ugesk. f. læger **91**:961 (Nov. 7) 1929; abstr., J. A. M. A. **94**:146 (Jan. 11) 1930.

Precipitation methods were held superior to the Wassermann, and they concluded that both be done on all specimens.

In this work the Wassermann, Kahn and Vernes flocculation tests were done on identical specimens of blood serum. Standard technics were followed for each test.[9] The Wassermann test was done with 2 antigens, the Kolmer and the 0.4 per cent cholesterolized alcoholic extract of powdered beef heart. The patient's serum was used in quantities of 0.02 and 0.05 cc. with each antigen and 0.10 cc. serum in the control tube. Overnight fixation in the icebox and the antisheep hemolytic system were employed.

TABLE 1.—*Serologic Results on Identical Specimens of Serum from Patients Known to Be Nonsyphilitic*

Specimen No.	Wassermann Test		Kahn Test	Vernes Flocculation Test		
	Kolmer	B.H.C.		R.T.	C.T.	Result
169	—	—	—	175	172	3
170	—	—	—	155	145	10
171	—	—	—	152	150	2
172	—	—	—	164	162	2
173	—	—	—	127	127	0
174	—	—	—	133	133	0
175	—	—	—	137	135	2
176	—	—	—	129	128	1
177	—	—	—	134	132	2
178	—	—	—	143	140	3
180	—	—	—	126	126	0
181	—	—	—	130	130	0
182	—	—	—	130	130	0
183	—	—	—	132	132	0
184	—	—	—	144	143	1
185	—	—	—	133	132	1
186	—	—	—	157	157	0
187	—	—	—	157	155	2
188	—	—	—	146	140	6
189	—	—	—	138	138	0
190	—	—	—	129	129	0
191	—	—	—	139	139	0
192	—	—	—	142	141	1
193	—	—	—	154	153	1
194	—	—	—	135	135	0
195	—	—	—	125	123	2
196	—	—	—	138	138	0
197	—	—	—	146	146	0

In this and following tables, these abbreviations are used: Kolmer Wassermann (Kol.Wass. or KW); cholesterolized beef heart Wassermann (B.H.C. or CW); Kahn test (Kt) and with the Vernes flocculation test, the reaction tube as (R.T. or Rt), the control tube as (C.T. or Ct) and the result as Re. The numerals following the Wassermann and Kahn tests designate the intensity of the reactions while with the Vernes test the numerals designate the photometric readings. Sn is for specimen number.

9. Kahn, R. L.: Serum Diagnosis of Syphilis by Precipitation, Baltimore, Williams & Wilkins, 1925, pp. 139-147. Vernes, A.: L'organisation de la syphilimetrie, Trav. et publ. de l'inst. prophylact., Paris, 1923, part 2. Baylis, A. B.; Sheplar, A. E., and MacNeal, W. J.: The Vernes Flocculation Test as an Accessory Guide in the Combat Against Syphilis, Am. J. Syph. **10**:298 (April) 1926.

TABLE 2.—*Serologic Results on Identical Specimens of Serum from Patients Known to Be Syphilitic*

Specimen No.	Wassermann Test		Kahn Test	Vernes Flocculation Test		
	Kolmer	B.H.C.		R.T.	C.T.	Result
1	—	—	—	151	143	8
2	—	—	—	142	141	1
3	—	—	1	131	126	5
5	—	—	—	145	142	3
6	2	1	1	162	162	0
8	—	—	1	149	149	0
9	4	4	4	236	130	106
10	4	4	4	144	130	14
11	—	—	4	138	131	7
12	4	4	4	149	147	2
13	—	—	2	138	132	6
14	—	—	—	140	140	0
15	2	2	2	186	148	38
16	3	3	2	139	139	0
17	—	—	—	160	160	0
18	4	4	4	228	212	16
19	—	—	—	157	157	0
21	4	4	2	148	145	3
22	—	—	—	147	147	0
24	—	—	—	136	126	10
27	4	4	4	200	150	50
29	1	3	3	167	152	15
30	—	—	1	139	139	0
31	4	4	4	194	144	50
32	—	—	—	162	159	3
33	4	4	4	245	202	43
34	—	—	—	130	130	0
36	2	3	3	149	135	14
37	—	—	—	135	135	0
39	—	—	—	140	140	0
40	—	—	—	210	195	15
41	4	4	2	246	163	83
42	4	4	2	230	135	95
43	—	—	—	197	197	0
44	—	—	1	137	134	3
45	4	4	4	176	134	42
46	2	1	3	202	200	2
47	—	—	—	154	154	0
49	—	—	—	130	129	1
50	2	2	2	129	129	0
51	—	—	—	135	135	0
52	—	—	1	139	133	6
53	2	3	3	138	127	11
54	4	4	3	228	195	33
55	3	3	3	144	132	12
56	—	—	—	138	136	2
57	—	—	1	153	153	0
58	4	4	2	136	129	7
60	—	—	—	130	128	2
61	—	—	—	153	151	2
62	—	—	1	136	136	0
63	—	—	2	150	142	8
64	—	—	—	145	147	—2
65	3	3	3	138	138	0
66	—	—	—	150	140	10
67	1	2	1	143	136	7
68	—	—	—	170	158	12
69	—	—	—	141	140	1
70	4	4	4	149	135	14
71	4	4	1	144	144	0
72	4	4	4	181	123	58
74	—	—	—	158	158	0
76	2	2	1	138	132	6
77	—	—	—	157	157	0
78	—	—	—	145	138	7
79	—	—	2	145	142	3
80	—	—	—	149	129	20
82	—	—	2	142	141	1

TABLE 2.—*Serologic Results on Identical Specimens of Serum from Patients Known to Be Syphilitic—Continued*

Specimen No.	Wassermann Test		Kahn Test	Vernes Flocculation Test		
	Kolmer	B.H.C.		R.T.	C.T.	Result
83	—	—	1	136	135	1
84	4	4	2	235	190	45
85	4	4	3	230	141	89
86	—	—	2	144	140	4
87	—	—	2	167	153	14
89	—	—	2	145	145	0
90	—	—	—	147	142	5
91	4	4	4	171	129	42
92	—	—	1	144	142	2
93	1	2	1	136	131	5
94	4	4	4	147	144	3
95	2	2	1	206	194	12
98	—	—	1	151	141	10
99	—	—	—	140	130	10
100	—	—	—	160	159	1
101	—	—	1	165	141	24
102	4	4	4	146	144	2
103	—	—	1	144	135	11
104	—	—	—	134	134	0
105	—	—	—	171	171	0
106	—	—	—	136	130	6
107	4	4	2	191	182	9
108	—	—	—	133	126	7
109	2	3	3	147	130	17
110	3	4	1	129	125	4
111	—	—	1	144	137	7
112	—	—	—	157	139	18
113	1	1	1	132	128	4
114	—	—	2	171	139	32
115	4	4	2	158	158	0
116	4	4	4	134	132	2
117	—	—	1	175	165	10
118	—	1	2	181	175	6
119	4	4	4	146	124	22
120	—	—	—	120	120	0
121	2	3	3	133	127	5
123	4	4	2	167	153	14
124	—	—	—	129	127	2
125	—	—	—	149	145	4
126	—	—	—	132	132	0
128	—	—	—	153	150	3
129	4	4	3	138	125	13
130	—	—	—	160	148	12
131	1	3	3	131	122	9
132	—	—	—	121	135	—14
133	3	3	1	141	132	9
134	—	—	—	137	132	5
135	—	—	—	143	130	13
136	—	—	—	147	154	—7
137	—	—	—	154	150	4
138	4	4	2	138	137	1
139	4	4	2	140	135	5
140	—	—	—	140	137	3
142	—	—	—	158	156	2
150	—	—	—	137	137	0
151	—	—	—	157	157	0
152	—	—	2	161	146	15
153	—	—	—	140	133	7
154	—	—	—	134	128	6
155	—	—	—	135	135	0
160	—	—	2	140	136	4
161	—	—	1	145	144	1
162	—	—	1	164	162	2
163	—	—	—	146	142	4
164	—	—	—	155	153	2
165	—	—	—	147	136	11
166	—	—	—	189	164	25
167	—	—	—	138	135	3

Twenty-eight serums from patients known to be nonsyphilitic were examined. The Kahn, Wassermann and Vernes flocculation tests were done on each specimen. All of the Wassermann and Kahn tests were negative. The Vernes flocculation test was negative 26 times but gave presumptive evidence of syphilis twice; Sn 188 and 170.

One hundred thirty-six serums from both treated and untreated syphilitic patients were examined. For each specimen a Kahn, Wassermann and Vernes flocculation test was done. With the Kolmer antigen Wassermann test, there were 29 four plus serums, 5 three plus serums,

TABLE 3.—*Serologic Results on Identical Specimens of Serum from Early Syphilis* *

Case No.	Wassermann Test: Kolmer	Wassermann Test: B.H.C.	Kahn Test	Vernes Flocculation Test: R.T.	C.T.	Result	Diagnosis
8830	— —	— —	—	151	143	8	Chancre
1310	— —	— —	—	142	141	1	Chancre
4285	— —	— —	—	145	142	3	Chancre
4796	3 1	2 1	1	162	162	0	Chancre
6715	— —	— —	1	131	126	5	Chancre
4038	4 4	4 4	4	144	130	14	Syphilis 1-2 (early)
6129	— —	— —	4	138	131	7	Syphilis 1-2 (early)
7068	4 4	4 4	4	149	147	2	Syphilis 1-2 (early)
8773	3 1	3 1	2	186	148	38	Syphilis 1-2 (early)
9552	4 2	4 3	2	139	139	0	Syphilis 1-2 (early)
5226	— —	— —	—	160	160	0	Syphilis 1-2 (early)
7736	4 4	4 4	4	228	212	16	Syphilis 1-2 (early)
2793	4 4	4 3	2	148	145	3	Syphilis 1-2 (early)
7026	— —	— —	—	136	126	10	Syphilis 1-2 (early)
8457	4 4	4 4	4	236	130	106	Syphilis 1-2 (early)
6797	4 4	4 4	4	200	150	50	Syphilis 2
3986	2 1	4 2	3	167	152	15	Syphilis 2
8373	4 4	4 4	4	194	144	50	Syphilis 2
78	— —	— —	—	162	159	3	Syphilis 2
1504	4 4	4 4	4	245	202	43	Syphilis 2
5673	— —	— —	—	130	130	0	Syphilis 2
6126	3 1	4 1	2	150	135	15	Syphilis 2
6768	— —	— —	1	149	149	0	Syphilis 2
854	— —	— —	—	140	140	0	Syphilis 2
585	— —	— —	—	210	195	15	Syphilis 2

* Following treatment in cases 9552, 7736 and 2793 there were negative Wassermann, Kahn and Vernes tests; in case 7068 there was a 2 plus Kahn, a Vernes result of 5 and a negative Wassermann test.

10 two plus serums, and 5 one plus serums, or a total of 49 positive reactions. With the cholesterolized beef heart antigen Wassermann test, there were 30 four plus serums, 10 three plus serums, 6 two plus serums, and 4 one plus serums, or a total of 50 positive reactions. The Kahn test showed 15 four plus, 11 three plus, 23 two plus, and 26 one plus, or a total of 75 positive serums. The Vernes flocculation test gave a reading of 5 or more in 67 serums. Of the 136 specimens, there was a total negative agreement in 39 serums and a total positive agreement in 37 serums, while 60 serums showed disagreement.

There were 25 cases of primary and secondary syphilis studied. The Kahn, Wassermann and Vernes flocculation tests were done on identical specimens before any treatment was instituted. Serologic discord was present in those cases with primary and very early secondary

TABLE 4.—*Serologic Results on Identical Specimens of Serum from Treated Patients with Tertiary Syphilis*

Case No.	Wassermann Test		Kahn Test	Vernes Flocculation Test			Diagnosis
	Kolmer	B.H.C.		R.T.	C.T.	Result	
615	— —	— —	2	142	141	1	Dementia paralytica
8512	4 4	4 4	2	191	182	9	Dementia paralytica
3990	— —	— —	1	175	165	10	Dementia paralytica
4031	— —	— —	—	147	142	5	Taboparesis
9479	4 4	4 4	2	158	158	0	Taboparesis
3254	— —	— —	—	173	169	4	Tabes dorsalis
3171	4 4	4 4	2	235	190	45	Tabes dorsalis
77	— —	— —	2	145	145	0	Tabes dorsalis
3932	4 4	4 4	4	147	144	3	Tabes dorsalis
4224	3 —	3 —	1	132	128	4	Tabes dorsalis
233	— —	— 3	2	181	175	6	Tabes dorsalis
5152	— —	— —	—	129	127	2	Tabes dorsalis
1241	4 4	4 4	4	181	123	58	Cerebrospinal syphilis
3524	4 4	4 4	3	230	141	89	Cerebrospinal syphilis
9189	4 4	4 4	4	174	129	45	Cerebrospinal syphilis
8483	— —	— —	—	160	159	1	Cerebrospinal syphilis
112	— —	— —	1	165	141	24	Cerebrospinal syphilis
9368	— —	— —	—	171	171	0	Cerebrospinal syphilis
2001	— —	— —	—	136	130	6	Cerebrospinal syphilis
9923	— —	— —	—	133	126	7	Cerebrospinal syphilis
1420	— —	— —	1	144	137	7	Cerebrospinal syphilis
160	2 —	3 —	2	171	139	32	Cerebrospinal syphilis
3683	— —	— —	—	157	139	18	Cerebrospinal syphilis
2747	4 4	4 4	4	146	124	22	Cerebrospinal syphilis
2561	3 1	3 2	1	138	132	6	Cardiac syphilis
5705	— —	— —	—	149	145	4	Vascular syphilis
2844	— —	— —	—	157	157	0	Syphilis of liver

TABLE 5.—*Serologic Results on Identical Specimens of Serum from Treated Patients with Tertiary Syphilis*

Case No.	Wassermann Test		Kahn Test	Vernes Flocculation Test			Diagnosis
	Kolmer	B.H.C.		R.T.	C.T.	Result	
27	— —	— —	—	145	138	7	Gumma of rectum
7031	4 4	4 4	2	167	153	14	Gumma of skin
8414	— —	— —	—	197	197	0	Asymptomatic
5711	— —	— —	1	137	134	3	Asymptomatic
1990	— —	— —	—	154	154	0	Asymptomatic
9001	— —	— —	1	139	133	6	Asymptomatic
576	3 2	4 2	3	138	127	11	Asymptomatic
6387	4 4	4 4	3	232	195	37	Asymptomatic
8325	4 3	4 3	3	144	132	12	Asymptomatic
2005	— —	— —	—	137	135	2	Asymptomatic
10090	— —	— —	1	151	151	0	Asymptomatic
9721	4 4	4 4	2	136	129	7	Asymptomatic
4675	— —	— —	1	145	147	—2	Asymptomatic
4673	4 2	4 3	3	138	138	0	Asymptomatic
2191	— —	— —	—	150	140	10	Asymptomatic
6431	2 1	4 1	1	143	136	7	Asymptomatic
1811	4 4	4 4	4	149	135	14	Asymptomatic
2322	4 4	4 4	1	144	144	0	Asymptomatic
10180	— —	— —	1	136	135	1	Asymptomatic
46	— —	— —	1	144	142	2	Asymptomatic
9877	3 —	4 1	1	136	131	5	Asymptomatic
232	4 1	4 1	1	206	194	12	Asymptomatic
99	4 4	4 4	4	146	144	2	Asymptomatic
3305	4 4	4 4	4	134	132	2	Asymptomatic
6399	4 1	4 2	3	133	127	5	Asymptomatic
656	— —	— —	—	132	132	0	Asymptomatic
4715	— —	— —	—	158	158	0	Asymptomatic

syphilis. In 5 primary syphilitic serums, the serologic tests were either negative or weakly positive. Serologic disagreement was present in 2 (585 and 6768) of the cases with secondary syphilis; in 4 (7026, 2793, 9552, and 6129) of 10 cases of primary and secondary syphilis and in 3 (8830, 4796, and 6715) of 5 early primary cases. The presence of discord in early syphilis and of only slight disagreement in more advanced secondary cases is of considerable clinical value. Occasionally, all tests are negative, but these should be rare and require further laboratory investigation.

There were 54 treated cases of tertiary syphilis investigated. This series included 3 cases of dementia paralytica, 2 of taboparalysis, 7 of tabes dorsalis, 12 of cerebrospinal syphilis, 1 of cardiac syphilis, 1 of vascular syphilis, 1 of syphilis of the liver, 1 gumma of the rectum,

TABLE 6.—*Provocative Results on Identical Specimens of Serum from Treated Patients with Syphilis with Negative Serology*

Case No.	Specimen collected: One Day Later				Two Days Later				One Week Later			
	Wassermann			Vernes	Wassermann			Vernes	Wassermann			Vernes
	Kol.	B.H.C.	Kahn	Result	Kol.	B.H.C.	Kahn	Result	Kol.	B.H.C.	Kahn	Result
3935	..	..	..	..	—	—	..	12	—	—	—	1
4030	—	—	—	2	—	—	1	10	—	—	—	0
6647	—	—	—	13	—	—	—	—7	—	—	—	4
9514	4	4	2	1	4	4	2	5	—	—	—	3
823	—	—	—	13	—	—	—	2	..	..	..	..
1044	—	—	—	0	..	..	..	..	—	—	—	0
167	..	..	..	..	—	—	—	0	—	—	1	1
4897	—	—	—	4	—	—	—	2	..	..	..	..
3407	—	—	—	11	..	..	..	..	—	—	—	24
2787	..	..	..	..	—	—	1	15	..	..	..	..
86	..	..	..	..	—	—	2	5	—	—	1	1

1 gumma of the skin and 25 asymptomatic cases. All of these patients had been under antisyphilitic treatment and had previously given a positive reaction to the Wassermann test. After a rest period, the Wassermann, Kahn and Vernes flocculation tests were done on an identical specimen. In 12 cases (3254, 5152, 8483, 9368, 5705, 2844, 8414, 1990, 2005, 10090, 656, and 4715) all of the tests were negative. In the remaining 42 cases in which one or more tests gave positive results, there were 25 positive with the Kolmer antigen Wassermann test, 26 positive with the B.H.C. antigen Wassermann test, 37 positive with the Kahn test, and 29 positive with the Vernes flocculation test. Discord was present in 18 of 42 specimens.

Provocative results on identical specimens of serum from treated patients with syphilis with negative serology showed marked disagreements. Of the 7 serums obtained one day after the administration of arsphenamine, there was only one positive Wassermann test, one positive Kahn test and three positive Vernes tests. Of the 9 serums tested two

days later there was one positive Wassermann, two moderately positive Kahn tests, two weakly positive Kahn tests and five positive Vernes tests. Of the 8 serums tested one week later there was no positive Wassermann test, two weakly positive Kahn tests and one positive Vernes test. These results indicate that the Vernes flocculation test for syphilis is more frequently positive than either the Kahn or Wassermann test following the provocative dose of arsphenamine.

TABLE 7.—*Provocative Serologic Results on Identical Specimens of Serum from Patients Without Syphilis*

Case No.	Specimen collected: One Day Later Wassermann Kol.	B.H.C.	Kahn	Vernes Result	Two Days Later Wassermann Kol.	B.H.C.	Kahn	Vernes Result	One Week Later Wassermann Kol.	B.H.C.	Kahn	Vernes Result
11602	—	—	—	0	—	—	—	0	—	—	—	0
9613	—	—	—	1	—	—	—	2	..	..	..	..
4323	—	—	—	0	—	—	—	0	—	—	—	2
4926	—	—	..	0	—	—	—	2	—	—	—	5
3485	—	—	..	1	—	—	..	..	—	—	—	3

TABLE 8.—*Serologic Results on Identical Specimens of Serum from Patients with Congenital Syphilis*

Case No.	Wassermann Test Kolmer	B.H.C.	Kahn Test	Vernes Flocculation Test R.T.	C.T.	Result
1335	2 —	3 —	Positive	164	155	9
2785	— —	— —	—	153	150	3
4374	4 4	4 4	3	138	125	12
1895	4 4	4 4	Positive	176	142	32
8604	4 4	4 4	2	170	146	24
9157	4 4	4 4	4	217	198	19
1769	4 4	4 4	4	198	143	55
2398	— —	— —	1	134	133	1
10235	4 4	4 4	3	171	131	41
2399	— —	— —	—	137	137	0
6061	4 4	4 4	Positive	160	127	33

Provocative serological results in five patients without syphilis showed complete agreement with one borderline exception (4926).

Serologic results on identical specimens of serum from 11 cases of congenital syphilis agreed in all tests except in (2398), in which the Kahn test was one plus, whereas the Wassermann and Vernes tests were negative. The tendency for the Wassermann and Vernes tests to be marked was noticeable, whereas the Kahn test gave weaker reactions.

SUMMARY

Serologic results on identical specimens of serum from patients known to be nonsyphilitic agree, whereas those from syphilitic patients who have been treated disagree. The Vernes flocculation test and the

Kahn precipitation test may give positive results before the Wassermann test in early primary syphilis. Only slight disagreement existed in cases of primary and early secondary syphilis. Very close agreement existed in secondary syphilis. Tertiary cases of syphilis showed marked disagreement, probably due to treatment.

Serologic results on identical specimens of serum following the provocative procedure showed that the Vernes flocculation test and the Kahn precipitation test gave positive reaction more frequently than the Wassermann test.

Serologic results on identical specimens of serum from congenital cases of syphilis showed marked agreement. The Wassermann and the Vernes tests were more strongly positive than the Kahn tests.

It is evident that more than one test, including the Wassermann, is indicated as a guide in the treatment for syphilis.

Abstracts from Current Literature

EDITED BY DR. HERBERT RATTNER

TUMORS OF PERIPHERAL NERVES. DEAN LEWIS and DERYL HART, Ann. Surg. **92**:961 (Dec.) 1930.

This article is of interest to the dermatologist because of its consideration of von Recklinghausen's disease. Sixteen cases in which the patients ranged in age from 4 to 56 years are considered from a surgical and a pathologic standpoint, almost all representing late stages of the condition. Of these, five patients presented superficial tumors only, while eleven presented deep tumors as well. In four of the eleven cases of deep tumors malignant changes had occurred. In the tumors of von Recklinghausen's disease the tissue is mixed. Pure fibromas as well as tumors containing neurinomatous tissue may be found, and central tumors may be pure neurinomas. Sarcomatous degeneration is prone to occur in the deep tumors. Trauma and operative intervention probably predispose to malignant degeneration in the tumors, an important fact to keep in mind when partial removal has been done. A form of the disease localized to an extremity to which the term elephantiasis nervorum might be applied is also described.

WIEDER, Milwaukee.

JUVENILE DEMENTIA PARALYTICA. W. C. MENNINGER, J. A. M. A. **95**:1499 (Nov. 15) 1930.

In this paper, Menninger has summarized in detail the symptoms and signs in forty cases of juvenile dementia paralytica, stressing the points of difference between it and adult dementia paralytica. His group comprised twenty-five females and fifteen males. There are two types of onset: the vague and indefinite development of the disease in a mentally or physically inferior child which may be apparent at birth or soon afterward, and the more acute break after some years of normal development. Later the two groups are indistinguishable clinically. All of his patients were congenitally syphilitic; twenty-three had retarded mentality and twelve were retarded physically. Ten patients gave a history of convulsive seizures. As regards the neurologic picture, there are a number of points of difference between the juvenile and adult forms. The differences are preponderantly the increase in extent and variety of the organic manifestations of destructions in the juvenile cases; that is, they show more involvement of the cranial nerve, more extensive pupillary changes and more convulsions, and the motor symptoms appear earlier in the disease. This is so probably because the disease process involves an immature, rapidly-growing tissue which is more vulnerable to infection and more easily destroyed than adult tissue. This also determines the mental picture. When damage is done early in life, the result is feeblemindedness. The later damage occurs, the more nearly does the case resemble the picture of adult dementia paralytica. The writer takes issue with the "preparetic stage" theory, preferring to regard such asymptomatic cases as early dementia paralytica.

FAMILIAL NEUROSYPHILIS. CHARLES C. DENNIE, J. A. M. A. **95**:1571 (Nov. 22) 1930.

Dennie's study indicates that the type of syphilis in the parents does not determine the type of disease in the child. He groups familial neurosyphilis into four classes: children of a father with dementia paralytica; children of parents who have tabes dorsalis; children with cerebrospinal syphilis in the father or mother, or in both, and children with congenital syphilis in whom incomplete early treatment may have had some influence in the production of dementia paralytica. In the first group the father did not often transmit dementia paralytica to his child, although he did transmit syphilis. In the second group, tabes dorsalis is nearly always transmitted to the children, and nearly all of them show involvement of the central nervous system, or they show no involvement. Evidently in tabes dorsalis there is a more virulent organism than in dementia paralytica. The patient with the latter disease often dies; it does not develop in his family,

whereas the tabetic patient does not die from the disease, but he often transmits neurosyphilis to his entire family. In the third group, in which one or both parents have cerebrospinal syphilis, usually only in one child, the eldest, will tabes or dementia paralytica develop, and in the last group, in children just as in adults, an insufficient amount of treatment will sometimes precipitate a neuro-involvement. Thus with the exception of locomotor ataxia, there is no evidence that any special neurotrophic strain of *Spirochaeta pallida* is transmitted from parents to the children. The general view of familial neurosyphilis is one of tragic hopelessness. Though dementia paralytica is not transmitted, there is a heritage of inferior mentality and substandard physique which is almost as bad.

ALLERGY AND THE ACID-BASE BALANCE. HARRY BECKMAN, J. A. M. A. **95**:1582 (Nov. 22) 1930.

Beckman presents the hypothesis that there is an intimate connection between the state of allergy and the acid-base balance of the body. In doing so, he does not disparage the sensitization theory, but he thinks that it would be of value if enthusiasm for the exclusive study of sensitization was abated, at least to the extent of admitting that there are several other factors contributing toward the make-up of the allergic state. He attempts to show that the more acidotic the patient is rendered, whether by therapeutic measures, intercurrent disease, or environmental change, the less allergic he becomes; he cites as examples: diabetes mellitus, starvation, pregnancy, acute infectious diseases, sea voyage, sojourning at a high altitude and gastric acidity, in all of which the patients are more acidotic, and the tendency to allergy is usually decreased. He thinks that the improvement in allergic persons from treatment with calcium, acetylsalicylic acid, whisky and mineral acid is due to the fact that a relative acidosis is brought about. Accordingly, he gives his patients hydrochloric acid, and feeds them ketogenic diets.

PIGMENTED MOLE OF THE SOLE OF THE FOOT RESULTING IN MELANOTIC SARCOMA. ARTHUR D. KURTZ, J. A. M. A. **95**:1586 (Nov. 22) 1930.

In the case reported a small ulcer surrounded by a pigmented border was excised, and a section showed no evidence of malignant change. Ten months later there was a recurrence of a globular mass at the site, which was superficial and readily peeled out from its bed. A section of this showed malignant changes. Metastatic growths appeared on the body, and the patient died in six months.

SUDDEN DEATH FOLLOWING INTRAVENOUS INJECTION OF BISMUTH TARTRATE. STEPHEN H. CURTIS, J. A. M. A. **95**:1588 (Nov. 22) 1930.

The patient had received ten doses of 15 mg. each of bismuth tartrate suspended in 5 cc. of distilled water. The injections were given intravenously at weekly intervals for an old syphilitic condition. After each injection the patient experienced abdominal pain with watery stools once or twice, after which the reaction promptly subsided. He then rested for one month, and immediately after the first injection on the resumption of treatment, the patient went into a state of collapse and died.

ASYMPTOMATIC NEUROSYPHILIS. JOSEPH EARLE MOORE and H. HANFORD HOPKINS, J. A. M. A. **95**:1637 (Nov. 29) 1930.

This paper is the sixth in a series on neurosyphilis. Evidence is presented from a study of 123 case reports, which supports the view that abnormalities of the spinal fluid in patients with early or late syphilis who show no clinical evidence of involvement of the nervous system are of grave prognostic import. The patients were divided into three groups: group 1 included patients with minimal serologic abnormalities (increased cell count and globulin content, with other tests negative); group 3, those with maximal changes (the paretic formula), and group 2, those with spinal fluids of an intermediate type. In group 1, of 14 patients, 6 were serologically and clinically well; in group 2, good results were obtained in approx-

imately 50 per cent of cases, while in group 3, only about 10 per cent were symptomatically well. The paper includes tabulated data with a critical analysis of the table to which several other workers contributed discussions.

EMBOLIA CUTIS MEDICAMENTOSA. E. A. SKOLNIK and RUBEN NOMLAND, J. A. M. A. **95**:1742 (Dec. 6) 1930.

The authors report a case in which local arterial embolism followed the intramuscular injection of mercuric salicylate in oil. There was pain during the injection followed by a burning sensation, chills and fever. A shallow ulcer developed at the site, which healed after one month, leaving a reticulated brown pattern.

A REAGENT FOR DEMONSTRATING FUNGI IN SKIN SCRAPINGS AND HAIR. THEODORE CORNBLEET, J. A. M. A. **95**:1743 (Dec. 6) 1930.

Cornbleet uses a new preparation that demonstrates fungi more clearly and more rapidly than potassium hydroxide. Sodium sulphide crystals are dissolved with a few drops of water. This is added to an equal amount of 95 per cent alcohol, and a cloudy precipitate forms. Distilled water is then added drop by drop until the precipitate redissolves and remains in solution. The reagent should be kept in a glass-stoppered bottle with the neck coated in paraffin. To demonstrate fungi, it is recommended that the scales should first be soaked in ether to remove surface oil. Several drops of the reagent are then run beneath the cover slip, and in from five to ten minutes the preparation is cleared for examination.

THE PRENATAL TREATMENT OF SYPHILIS. UDO J. WILE and JOSEPH W. SHAW, J. A. M. A. **95**:1791 (Dec. 13) 1930.

From a study of 100 cases of pregnancy complicated by syphilis of recent origin, the authors conclude that prenatal treatment results in a marked decrease of the feticidal effects of the disease. Arsphenamine is well tolerated, and there is no apparent relationship between the administration of the drug and miscarriage or abortion. They hold that regardless of the absence of clinical or serologic observations, it seems wise to treat babies born of mothers in whom the syphilis is of recent origin, to supplement the prenatal treatment of the mother. The article is a statistical study with a critical analysis of the pertinent literature. Other workers who discussed the paper differed in their views on the importance of positive serologic tests of blood from the cord and as to how late in pregnancy treatment could be carried out.

PELLAGRA-LIKE SKIN LESIONS APPEARING IN THE COURSE OF A KETOGENIC DIET. RILEY H. GUTHRIE, J. A. M. A. **95**:1912 (Dec. 20) 1930.

This is the second case to be reported recently in which changes of the skin of the character seen in pellagra appeared after a ketogenic diet. The changes of the skin appeared seven months after the diet was instituted for epilepsy and disappeared when the diet was corrected.

RATTNER, Chicago.

STUDIES IN THE SEROLOGY OF SYPHILIS: I. THE MECHANISM OF THE FLOCCULATION REACTIONS. H. EAGLE, J. Exper. Med. **52**:717 (Nov.) 1930.

A physical-chemical explanation of the flocculation reactions is given by Eagle who suggests that reagin globulin represents an antibody response to products of infection.

STUDIES IN THE SEROLOGY OF SYPHILIS: II. THE PHYSICAL BASIS OF THE WASSERMANN REACTION. H. EAGLE, J. Exper. Med. **52**:739 (Nov.) 1930.

Both the flocculating and complement-fixing properties of syphilitic serum are determined by the same substance, a specifically altered fraction of the serum globulin, reagin. The Wassermann reaction is thus entirely analogous to complement fixation by any antigen-antibody complex.

STUDIES IN THE SEROLOGY OF SYPHILIS: III. EXPLANATION OF THE FORTIFYING EFFECT OF CHOLESTERIN UPON THE ANTIGEN AS USED IN THE WASSERMANN AND FLOCCULATION TESTS. H. EAGLE, J. Exper. Med. **52**:747 (Nov.) 1930.

Small quantities of cholesterol added to the alcoholic extract of normal tissue used in the serum diagnosis of syphilis markedly increases its sensitivity. Cholesterol causes a coarsened dispersion of antigen by forming a relatively large nucleus on which antigen is adsorbed. The larger the antigen particle the greater is its avidity for reagin per unit surface or mass. The coarsened dispersion caused by cholesterol completely explains the greater sensitivity of the cholesterolized antigen in complement fixation.

The sensitizing action of cholesterol increases indefinitely with its concentration. However, its solubility in alcohol is small. These and other considerations have led to a search for substances similar to cholesterol but more soluble in alcohol. Such substances, shortly to be reported, make possible an antigen which is from two to ten times as efficient in the Wassermann test as any now available.

ANDERSON, Los Angeles.

THE FUNGI FOUND IN NORTH AMERICAN BLASTOMYCOSIS: THEIR PLURALITY OF SPECIES. ALDO CASTELLANI, Brit. J. Dermat. **42**:365 (Aug.-Sept.) 1930.

Castellani describes the fungi found in North American blastomycosis, in a fairly large number of cases that he has been able to investigate in the United States during the last six years. His researches lead him to believe that there is a plurality of species of the fungi causing North American blastomycosis, and that these fungi belong to the *Fungi imperfecti* and probably to the same genus. Since, for botanical reasons, the genus *Blastomyces* cannot stand, he has suggested the creation of a new genus—*Blastomycoides*—of which he gives a brief description. He states that in all probability this genus contains a number of species, but for the time being he differentiates the following: *Blastomycoides immitis, Blastomycoides dermatitidis, Blastomycoides tulanensis* and *Blastomycoides lanoginosus*. By using mannitol agar, gelatin and serum, the four types can be easily differentiated. *B. immitis* produces black pigmentation on mannitol agar, and liquefies serum and gelatin very rapidly within three days from inoculation; *B. tulanensis* does not produce black pigmentation on mannitol agar, its growth being creamy white with a fine cottony surface; it does not liquefy gelatin and serum within the first two weeks after inoculation, although later a slow process of liquefaction usually takes place; *B. dermatitidis* does not produce black pigmentation on mannitol agar and liquefies gelatin and serum rapidly within a week from inoculation; *B. lanoginosus* does not produce black pigmentation on mannitol agar, its growth being white or whitish yellow with a peculiar woolly surface; it liquefies gelatin and serum rapidly, always within a week from inoculation. Numerous illustrations of the fungi in hanging drop specimens, the growths of the respective fungi on mannitol agar and two photographs showing the type of lesion produced clinically by *B. tulanensis* accompany the article.

TELANGIECTASIA MACULARIS ERUPTIVA PERSTANS. F. PARKES WEBER and R. HELLENSCHMIED, Brit. J. Dermat. **42**:374 (Aug.-Sept.) 1930.

A case is described in a Russian Jewess, aged 60, obese and of the phlegmatic type, who was under treatment for a duodenal ulcer, and in whom, since the age of 40, a condition of generalized cutaneous macular telangiectasia had developed, which had become quiescent. The persistent red macules were distributed chiefly over the upper part of the thorax in front, the outer surfaces of the upper limbs and the abdomen. The individual lesions were more or less circular, with ill defined outlines, varying from 2 to 6 mm. in diameter, and only slightly, if at all, raised. The red color completely disappeared under diascopic pressure, but in some of the lesions slight brownish pigmentation was left. Also, over some the skin was slightly atrophic and shiny; there was no desquamation. Though the macules were clearly due to permanent telangiectatic hyperemia, no individual dilated blood vessels could be distinguished in them with the naked eye, whereas

over the patient's face there were many threadlike, arborescent telangiectases of the ordinary type. There was no purpuric complication and no itching. Three photographs showing the clinical appearance and distribution of the lesions are presented. The authors have termed the condition telangiectasia macularis eruptiva perstans and discuss the etiology in their case together with a discussion of the classification of telangiectases and hemangiomas, with references to the literature. They think that there are two great groups: (1) a familial (hereditary) noncongenital group, of which "telangiectasia hereditaria hemorrhagica" (Osler) is the most important type, and (2) noncongenital and mostly nonfamilial case of "generalized telangiectasia," including the case reported. In an addendum to the article by Weber certain clinical similarities noted on subsequent examination in the case reported with a case in a woman, aged 26, with a typical urticaria pigmentosa of adults led him to suggest the possibility that telangiectasia macularis eruptiva perstans may turn out to be allied to a rare telangiectatic, relatively pigmentless variety of urticaria pigmentosa of adults, in more elderly subjects.

THE THERAPEUTIC VALUE OF GOLD COMPOUNDS (SANOCRYSIN, KRYSOLGAN, ETC.). A. C. ROXBURGH and H. CORSI, Brit. J. Dermat. **42**:382 (Aug.-Sept.) 1930.

The therapeutic results of the use of gold compounds in forty-two cases is discussed. The diseases treated were lupus erythematosus (thirty-five cases), erythema induratum-Bazin (four cases), and papulonecrotic tuberculids, erythrocyanosis frigida and pityriasis lichenoides et varioliformis acuta (one case of each). The article deals chiefly with lupus erythematosus, and the results are summed up as follows: Thirty-five patients with lupus erythematosus were treated by the injection of one or both gold salts; eight patients were temporarily cured; six, vastly improved; nine, definitely improved; two, slightly improved; five, uninfluenced, and five, worse after treatment. Local treatment was not applied during the treatment with the gold compound. Toxic reactions followed about 6 per cent of the injections. The reactions were unimportant except in three cases, in which either a mild gold dermatitis or an extensive exacerbation of the disease was produced, which was temporary. In one case a severe stomatitis followed the ninth injection of sodium aurothiosulphate (sanocrysin). Nine of twelve cases of lupus erythematosus tested gave evidence of the presence of tuberculosis, and three evidence of its absence (negative Mantoux test). No differences in the proportion of successes or failures with treatment with a gold compound were noted between the tuberculous and the nontuberculous cases. Both of these drugs appear to the authors to be of considerable value in the treatment for lupus erythematosus, although neither of them can be regarded as a cure for the disease. There seems to be little choice between the two drugs. Sodium aurothiosulphate is perhaps slightly more effective, but is also slightly more toxic in the doses given, of which the maximum was two and one-half times that of 4 amino-2 aurothiophenol carbonic acid (krysolgan), and it seems to produce its effect more quickly, no doubt for the same reason.

The results in cases of erythema induratum were as follows: In one recent case the patient was cured by four injections of amino-auro-thiophenol carbonic acid; in one older and more severe case the patient was improved only after forty-three injections; in one patient the condition was unaltered by six injections, and in one, although the condition was uninfluenced by twelve injections of 4 amino-2 auro-thiophenol carbonic acid, improvement occurred after six injections of sodium aurothiosulphate. In the single case of papulonecrotic tuberculid, the patient was improved after eight injections of 4 amino-2 auro-thiophenol carbonic acid, totalling 1.749 grains; in that of erythrocyanosis frigida crurum, the patient was improved after seven injections (1.394 grains) of 4 amino-2 auro-thiophenol carbonic acid, and in the single case of pityriasis lichenoides et varioliformis acuta the condition was uninfluenced after four injections (0.099 grains) of 4 amino-2 auro-thiophenol carbonic acid. In a footnote Roxburgh mentions a case of pityriasis lichenoides et varioliformis acuta in a nurse in whom the rash entirely disappeared after eight weekly injections of 4 amino-2 auro-thiophenol carbonic acid (from 0.0015 to 1.5 grains).

A Case of Elephantiasis Due to Congenital Syphilis. P. C. P. Ingram, Brit. J. Dermat. **42**:391 (Aug-Sept.) 1930.

A case is reported in a man, aged 43, who was undersized, myopic and anemic, wearing dentures, with a saddle nose and a gummatous ulcer on the frontal bone, with underlying necrosis of almost the whole of the frontal bones. There was elephantiasis of both feet, legs and thighs up to the level of the great trochanters. The scrotum and penis were also involved, and on the latter, warty growths were present. There was some superficial ulceration of both legs. The heart, lungs and urine revealed nothing abnormal. The Wassermann test of the blood gave a strongly positive reaction. A distinct improvement in his condition resulted from antisyphilitic treatment, but the ulcer on the skull persisted, and he finally died, apparently of toxemia and lardaceous disease. A photograph illustrating the elephantiasis accompanies the article.

Wien, Chicago.

The Hemoclastic Reaction (D'Amato) and the Leukocyte Reaction (Gouin) in the Diagnosis of Syphilis. R. de Blasio, Ann. de dermat. et syph. **1**:1014 (Oct.) 1930.

D'Amato, in 1921, according to de Blasio, called attention to a specific hemoclastic reaction in several infectious diseases, notably in syphilis. This reaction was characterized by leukopenia after the injection of an antisyphilitic remedy in a syphilitic person. Gouin and his associates recently studied the leukocyte reaction in syphilis and found that the injection of an antisyphilitic remedy produced an apparently specific leukocytosis in syphilitic subjects. These apparently diametrically opposite observations are reviewed by the author, who adds some personal investigations of the subject. He followed the technic of both tests with simultaneous control by the Wassermann and Sachs-Georgi reactions. He found that the D'Amato and Gouin procedures, while apparently opposed, actually register two different phases of a hemoclastic shock. The leukopenia is a more specific response than the leukocytosis. D'Amato's reaction should be used in cases with a negative Wassermann reaction and in visceral syphilis. Both reactions have only value as evidence contributing to a diagnosis. Gouin's work is not as original as that author thought.

A Case of Death Due to Teinture Capillaire (Lead). Valdiguié and Planque, Ann. de dermat. et syph. **1**:1026 (Oct.) 1930.

The authors' patient dyed her hair with the teinture capillaire. This was followed by a dermatitis of the face, neck and hands, and after some weeks by grave general symptoms and death.

The preparation contained lead hyposulphite dissolved in an excess of alkaline hyposulphite. The authors discuss the toxicology of the preparations and legal matters connected with its sale to the public. They believe its sale should be interdicted. Toilet preparations should bear a label indicating the contents.

Lichen Trichophyticus and Lichen Planus: Cure of the Latter with Myco-Vaccine. Jausion, Sohier and Lartigue, Bull. Soc. franç. de dermat. et syph. **37**:1074 (July) 1930.

Four cases of lichen planus and one of lichen trichophyticus with atypical lichen planus are reported in which there was rapid response to the polyvalent myco-vaccine (clasine polymycosique) of the authors. In all the cases there was a positive intradermal trichophytin reaction. In these cases, therefore, there is a suggestion that the lichen planus was an allergic reaction in an individual with a fungus infection. The response to the myco-vaccine favors this assumption since it has been unsuccessful in diseases of nonmycotic origin. The present cases comported themselves like mycosids. The authors, however, feel that their experience is too limited to allow definite conclusions, which must await further observations.

ANOTHER CASE OF FAVUS CURED BY MYCO-VACCINE. JAUSION, SOHIER and NOYER, Bull. Soc. franç. de dermat. et syph. **37**:1092 (July) 1930.

The authors' polyvalent fungus vaccine has been named clasin by them. In a case of favus of the scalp of many years' duration, they obtained a cure with their preparation in about four months.

PEMPHIGUS VEGETANS: CURE BY NEOARSPHENAMINE AND AUTOHEMOTHERAPY. H. GOUGEROT, CIVATTE and P. BLUM, Bull. Soc. franç. de dermat. et syph. **37**:1126 (July) 1930.

In a case of pemphigus vegetans, clinically and histologically typical, the authors obtained a quick remission, which had endured for several months at the time of their report, by the use of neoarsphenamine and autohemotherapy. These measures were employed conjointly in the usual doses and intervals.

INVESTIGATIONS ON THE MYCOTIC ORIGIN OF PITYRIASIS ROSEA. JOYEUX, BURNIER and DUCHÈ, Bull. Soc. franç. de dermat. et syph. **37**:1128 (July) 1930.

The organism described by Vidal and DuBois has been found by the authors in twenty-eight of thirty cases of pityriasis rosea. They have been unable to cultivate it or to produce the disease by inoculation of pityriasis rosea scales.

DESTRUCTION OF PLANTAR WARTS BY THE HIGH FREQUENCY KNIFE. GIRAUDEAU, Bull. Soc. franç. de dermat. et syph. **37**:1132 (July) 1930.

Under certain circumstances, treatment of plantar warts by roentgen rays or radium is impracticable. For these cases, Giraudeau employs a special electrode attached to the high frequency (radioknife) apparatus. It is plunged into the wart, turned and withdrawn. The lesion, separated from its nerve and blood supply, soon disappears.

ERUPTION CAUSED BY RESINS OF TREES. LONGIN, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Lyon) **37**:741 (July) 1930.

Three cases of eczematiform eruptions produced by volatile constituents, escaping from freshly hewn wood are reported. In one case there was an exacerbation when an intradermal injection of an extract of the suspected wood was administered.

THE INTRADERMAL REACTION IN LYMPHOGRANULOMATOSUS INGUINALE. NICOLAS, J. FAVRE and F. LEBEUF, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Lyon) **37**:751 (July) 1930.

The authors employed two antigens; one a glycerin extract of the affected glands, the other prepared according to Frei's method. Both were found satisfactory. Their results show that the reaction is specific. The reaction becomes positive in from three to six weeks after the onset of the disease and persists indefinitely. This reaction indicates that lymphogranulomatosus inguinale is an entity provoking systemic allergic responses which may persist for years.

LICHEN PLANUS OF THE BUCCAL MUCOSA PRESENTING ULCERATION. J. GATÉ, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Lyon) **37**:760 (July) 1930.

This patient showed the ordinary type of lichen planus of the mucosa with shallow ulcerations in some areas on the cheeks. Characteristic lesions of lichen planus were present on the skin. Ulceration in lichen planus of the mucosa is rare but has been recorded, though standard texts state that it never occurs.

INTERMITTENT CLAUDICATION OF THE LEGS BENEFITED BY ANTISYPHILITIC THERAPY. GATÉ and TREPPOZ, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Lyon) **37**:815 (July) 1930.

In a woman, aged 62, proximal pain and circulatory disturbances of the legs disappeared after the institution of injections of bismuth and mercury. The

Wassermann reaction was positive, and the case appeared to be one of specific endarteritis.

TWO CASES OF DERMATITIS MEDICAMENTOSA DUE TO SODIUM SALICYLATE. J. NICOLAS, F. LEBEUF and J. ROUSSET, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Lyon) **37**:826 (July) 1930.

In the first case there was a polymorphous generalized eruption. It consisted of papules, papulovesicles and bullae. The patient had taken 120 grains (8 Gm.) of sodium salicylate by mouth for about a week. The second patient developed a generalized erythroderma after intravenous employment of the drug.

A RAPID STAIN FOR SPIROCHAETA PALLIDA. G. MASSIA and J. ROUSSET, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Lyon) **37**:843 (July) 1930.

The authors used the following stain:

	Gm. or Cc.
Victoria blue IV R	3.0
Pyronin	0.9
Methyl green	0.1
Absolute alcohol	9.0
Glycerin	10.0
Distilled water	100.0

Stain for four minutes and wash with water. This method gives excellent pictures, and on account of its simplicity is superior to the Fontana-Tribondeau technic.

ARTERIAL EMBOLISM DUE TO OIL-SOLUBLE BISMUTH. G. HUFSCHMITT, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:768 (July) 1930.

Hufschmitt records a typical case of arterial embolism due to oil-soluble bismuth following an intragluteal injection of the preparation. The author believes that the accident is not the result of injecting the drug into an artery but that the needle pierces the vessel and there follows a reflux of the solution along the needle track into the vessel. Hufschmitt remarks, however, that the injections that produced this accident have been accompanied by a sudden sharp pain, probably occasioned by injury to the sympathetic fibers. He believes that the needle should be withdrawn and the injection given in another area when pain is complained of.

INVESTIGATION OF WATER-SOLUBLE BISMUTH COMPOUNDS. H. MONTLAUR and M. PICON, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:871 (July) 1930.

The authors give a short report of their pharmacologic investigations of a number of hydrosoluble bismuth salts. The importance of the subject merits an extensive investigation. Pain accompanying injections of these salts is a serious drawback which may be overcome by the elaboration of other compounds. It is shown that water-soluble bismuth salts are less toxic than mercurials.

THE COMPARATIVE SPIROCHETICIDAL ACTION OF BISMUTH SALTS AND ARSPHENAMINE. G. LÉVY, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:877 (July) 1930.

Lévy studied the disappearance of spirochetes from chancres after the injection of various bismuth and arsphenamine preparations. The latter sterilize chancres more rapidly than bismuth compounds. The water-soluble and oil-soluble compounds seem to be of equal value in causing disappearance of spirochetes from chancres. They are more active in this regard than the insoluble salts.

THE ACTIVITY AND POSOLOGY OF BISMUTH IN THE TREATMENT OF SYPHILIS. A. SEZARY, J. PERNET and GALLERAND, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:879 (July) 1930.

The authors' conclusions are of a preliminary nature, since cases applicable for such a study are too few, and the time too short to allow final decisions. They believe that bismuth is superior to mercury in early syphilis, but inferior to the arsphenamines for intensive therapy. In late syphilis, there is some question whether the arsenicals are superior to bismuth. The best therapeutic effects are obtained with insoluble preparations of bismuth, except, perhaps in the very early stages of the disease.

THE TREATMENT OF SYPHILIS BY COLLOIDAL BISMUTH. L. DEKEYSER, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:885 (July) 1930.

After an experience with ninety cases, the author has concluded that this preparation is not suitable for treatment in early cases. Its action is evident but slow on the primary and secondary lesions. However, in gumma and in neurosyphilis, it has shown itself extremely efficacious. This is especially true of tabes. This preparation has produced satisfactory results from the serologic side.

WHY WE REMAIN FAITHFUL TO QUININE IODO-BISMUTHATE. HUDELO and RABUT, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:888 (July) 1930.

Hudelo and Rabut, as early as 1922, had found quinine iodo-bismuthate superior to other bismuth salts that they had used. They have compared this preparation ulteriorly with the oxide which contains four times as much metallic bismuth, but they found no appreciable difference in their results. Roentgenographic study revealed the reason, as it showed that the oxide remained in the muscle as an insoluble mass for as long as three years, only a portion of the mass being absorbed.

THE EFFICACY OF VARIOUS BISMUTH PREPARATIONS IN THE TREATMENT OF SYPHILIS. C. ILIESCO, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:890 (July) 1930.

The author concludes from a study of 257 cases of syphilis treated between 1925 and 1930 that bismuth has a curative effect on the lesions of all stages of the disease. The lesions heal most rapidly when liposoluble preparations are employed. Lesions of the mucosa yield more slowly to bismuth than those of the skin. Liposoluble preparations more quickly cause the disappearance of spirochetes from the lesions than do hydrosoluble and insoluble compounds. Liposoluble compounds also have more rapid influence on the serologic tests. Preparations of this type can be detected in the urine within from five to eight hours after injection, and bismuth is still being eliminated at least for twenty-five to thirty days after the completion of a course. Bismuth is likewise detectable in the cerebrospinal fluid after the seventh injection and for at least twenty-five days after the cessation of this medication. These observations apply to liposoluble compounds.

TWO AND ONE-HALF YEARS' EXPERIENCE WITH LIPOSOLUBLE BISMUTH SALTS. CLÉMENT-SIMON, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:903 (July) 1930.

The gist of Clément-Simon's brief remarks is that clinically and serologically a liposoluble bismuth (camphocarbonate) compound has compared favorably with the effects obtained with neoarsphenamine. On account of their better toleration, he prefers the oil-soluble preparations to the suspensions.

THE TREATMENT OF SYPHILIS WITH BISMUTH. EMERY, RASIS and MORIN, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:905 (July) 1930.

The authors, after considerable experience, believe that the insoluble preparations of bismuth give the best results. They favor bismuth hydroxide. The

same discussion concerning the relative value of different bismuth preparations is appearing as occurred earlier with the mercurials. As with mercury, the authors believe the final judgment will favor insoluble preparations.

A Bismuth-Arsenic-Pyridin Compound in the Treatment of Syphilis. H. Jausion and A. Pecker, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:910 (July) 1930.

Jausion and Pecker have investigated the effects of a bismuth-arsenic-pyridine compound. Their material is too small to allow definite conclusions, but they found that it has definite merit. It may be given intravenously mixed with mercuric cyanide.

The Prophylactic Value of Bismuth in Experimental Syphilis of the Monkey. C. Levaditi and P. Lépine, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:927 (July) 1930.

According to Levaditi and Lépine, bismuth administered to monkeys, in either insoluble or liposoluble form, induces a refractory state of long duration to syphilitic inoculations. Numerous cutaneous attempts at infection were unsuccessful, and the animals' inguinal glands were sterile.

The Treatment of Early Syphilis with Bismuth. L. Lortat-Jacob and J. Roberti, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:935 (July) 1930.

The authors report a series of twenty-nine cases of primary and secondary syphilis in which they have used bismuth exclusively; a soluble preparation has been employed chiefly.

Except for three cases of resistance to bismuth (these have been reported by the authors), all chancres healed rapidly and were negative on dark-field examination after the third injection. Mucous patches disappeared on the average after the fifth injection; macular eruptions from the fourth to eighth, while papular eruptions were somewhat more tenacious and vanished only after the eighth or tenth injection. Serologically, two thirds of the cases still gave positive reactions after two series of injections. This experience would indicate that bismuth should not replace arsenic in the treatment of early syphilis but is a valuable adjuvant.

What Place Has Bismuth in the Treatment of Syphilis? Emery, Rasis and Morin, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:937 (July) 1930.

In the practice of these authors, bismuth has practically replaced other drugs, including the arsenicals. They reserve the latter for those cases in which the systemic condition is poor, teeth bad or the age advanced, because bismuth is more of a depressant than arsenic, and more prone to provoke stomatitis.

Present Position of Bismuth in the Therapy of Syphilis. R. J. Weissenbach, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:940 (July) 1930.

Weissenbach briefly states his present position in regard to bismuth therapy. He employs either suspension in oil or oil-soluble preparations; water-soluble salts having proved unsatisfactory to him. The activity of a preparation, in his experience, is not in strict accord with its content of bismuth.

In the primary stage, the arsphenamines are given the choice, bismuth being employed as an adjuvant. This also applies to treatment of the florid secondary stage. In latent cases, arsphenamine, bismuth and mercury are all utilized. In syphilis of the viscera and sensory organs, bismuth takes a subordinate rôle in Weissenbach's practice. The chief indications for the use of bismuth are when the patients are intolerant to arsenic and mercury.

SIMULTANEOUS EMPLOYMENT OF NEOARSPHENAMINE AND BISMUTH IN SYPHILIS (SCHAMBERG'S METHOD). K. BEINTEMA, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:946 (July) 1930.

Beintema works in a rural venereal center in the Pays-Bas, where the patients are scattered in small villages. Thus, for their convenience, he instituted Schamberg's method of weekly combined treatment and has had quite satisfactory results from it. He has treated ninety-six patients in this way without accidents.

WHAT WE CAN EXPECT OF BISMUTH IN THE TREATMENT OF SYPHILIS. A. VERNES and M. LEGER, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:946 (July) 1930.

The authors conclude that bismuth is a valuable addition to the antisyphilitic arsenal. The stage of the disease, the tolerance of the patient and the location of the disease process are the factors which indicate the choice of preparation and the details of administration.

BISMUTH THERAPY IN SYPHILIS. NICOLAU, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:949 (July) 1930.

Nicolau says that he is not yet ready to come to a final decision of the place of bismuth in syphilis therapy. It seems inferior to the arsphenamines, and superior to the mercurials, with the possible exception of mild mercuric chloride.

The curative power of bismuth is now demonstrable since about ten cases of reinfection in which bismuth was the only treatment have been recorded. Among the cases of reinfection, one patient was treated when the disease was in the seropositive primary stage, and three others when it was in the florid secondary stage. It is not possible as yet to compare the abortive possibilities of bismuth with that of the arsphenamines. Nicolau's experience leads him to believe that the greater the bismuth content, the better the therapeutic effect of a preparation. Maximum therapeutic results are best obtained, at present, by the use of both the arsenicals and bismuth.

ARSENIC RESISTANCE AND BISMUTH THERAPY. J. NICOLAS and J. LACASSAGNE, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:957 (July) 1930.

The authors have noticed at Lyons an increasing number of arsenic-fast cases of syphilis. For the past three or four years these cases have been common. Some physicians have met the situation by abandoning the arsphenamines in favor of bismuth, but this procedure seems ill-advised. Nicolas and Lacassagne still place greatest dependence on neoarsphenamine, combining it with bismuth in the early stages of the disease. They do not agree with Milian that cases of arsenic-fastness are due to insufficient doses of the arsphenamines, and therefore do not increase the dosage and shorten the interval between injections as he advises. Rather they have recourse to bismuth.

THE PLACE OF BISMUTH IN SYPHILITIC TREATMENT. G. PETGES, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:962 (July) 1930.

Petges considers bismuth distinctly inferior to the arsphenamines, especially in the early periods of the disease. Bismuth, however, has a valuable rôle to play as reinforcement therapy to arsphenamine. Petges thinks that bismuth used alternately with arsphenamine may prevent arsenic-fastness, since he has never noted that condition when such alternate treatment was used.

BISMUTH THERAPY. MARCEL PINARD, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:964 (July) 1930.

Pinard believes that bismuth is as efficacious as neoarsphenamine in early syphilis. The latter is preferred for pregnant patients and in serious ocular diseases and in diseases of the circulatory and nervous systems. The best results are obtained, however, by long continued alternate treatment with bismuth and the arsenicals.

BISMUTH THERAPY OF SYPHILIS IN THE SERVICE OF LOUIS FOURNIER (1921-1930). A. SCHWARTZ, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:973 (July) 1930.

Schwartz, an assistant to Fournier, details at some length the impressions of an extensive experience with bismuth in Fournier's service at the Cochin Hospital. It will be recalled that Fournier and Guenot were the first to report on the clinical results of bismuth therapy. In Fournier's service, bismuth either in suspension or in liposoluble form has been employed to the exclusion of all other antisyphilitic medication. About 5,000 cases have been under observation.

Schwartz states that a dose of 0.08 Gm. (of bi-metal) is the optimum, with injections twice weekly, from ten to twelve injections constituting a series. As to the results, "an experience of three years permits the affirmation that the intramuscular injections of these preparations [liposoluble, in the foregoing doses] represent, at the present time, the treatment of choice in every form and manifestation of human syphilis."

SIMULTANEOUS BISMUTH-NEOARSPHENAMINE THERAPY IN SYPHILIS. A. SÉZARY, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:981 (July) 1930.

Sézary, in 1921, counselled the simultaneous employment of neoarsphenamine and bismuth. In the present short note, he discusses his experience with this method and concludes that it is very efficacious. He employs large doses of each preparation (a maximum of 0.9 Gm. of neoarsphenamine and 0.26 Gm. of bismuth element in simultaneous weekly injections) and finds it well-borne even by pregnant women. He gives ten injections in the first course, the first four with smaller ascending doses at intervals of from three to four days and the last six with maximum doses at intervals of seven days. The second course is the same as the first; then follow alternate courses of neoarsphenamine and bismuth.

BISMUTH AND THE WASSERMANN REACTION. LORTAT-JACOB and J. ROBERTI, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:1004 (July) 1930.

The authors have reviewed 1,408 records of cases of syphilis in which 1,277 persons (90.77 per cent) have shown an expected response; i. e., the Wassermann reaction has changed from positive to negative after a reasonable amount of treatment. These patients were treated with both arsenicals and bismuth.

In twenty-nine cases of early secondary syphilis in which only bismuth was employed, there was failure to reverse a positive Wassermann reaction in about one third of the cases after three series of injections of bismuth. So far as Wassermann-fast cases are concerned, bismuth seemed to exercise no better effect on them than other antisyphilitic remedies.

SEROLOGIC RESULTS FROM BISMUTH THERAPY. HUDELO and RABUT, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:1007 (July) 1930.

In all the patients treated in the serologically negative, primary stage, the Wassermann and Hecht reactions have remained negative. This was also true of those treated in the Wassermann positive primary stage. In secondary syphilis, Wassermann negativity has been obtained in 88 per cent. In the later stages of the disease, from 60 to 90 per cent of the cases have achieved negative serologic reactions.

ARTERIAL EMBOLISM FROM INJECTIONS OF BISMUTH: REPORT OF FIVE CASES. G. PETGES and P. JOULIA, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:1016 (July) 1930.

In five cases of arterial embolism due to injections of bismuth seen by the authors, two followed injections of bismuth suspensions, while three resulted from the employment of oil-soluble compounds. Study of these cases and those recorded

in the literature show that the condition is not a consequence of technical error, and from the legal standpoint professional responsibility can hardly be invoked. This accident may follow the most rigorously correct technic.

GANGRENOUS DERMATITIS FROM ARTERIAL EMBOLISM CAUSED BY INJECTIONS OF BISMUTH. P. FERNET, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:1021 (July) 1930.

Fernet distinguishes three degrees of severity of gangrenous dermatitis from arterial embolism: (1) a benign form, characterized by ecchymotic placards, (2) a form of medium severity exhibiting ecchymoses and bullae, and (3) a grave type, necrotic and gangrenous. The author has seen personally only two cases, both benign. Fernet thinks certain precautions may minimize the chances of this accident. Among these are the use of a larger caliber needle than is commonly employed, withdrawal of the needle if sharp pain is produced, avoidance of sclerosed areas (sites of previous injections) and shunning of the outer part of the buttock.

A STATISTICAL STUDY OF BISMUTH INTOLERANCE. P. VIGNE, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:1034 (July) 1930.

Vigne bases his report on a five years' experience at the Hotel Dieu in Marseilles, where approximately 76,000 injections of bismuth were given during that period. Of 2,393 patients given bismuth, 202 (8.8 per cent) were forced to abandon that medication because of intolerance. The most common manifestation of intolerance was stomatitis (72 per cent), while asthenia, abscesses, local pain, cutaneous eruptions and various systemic symptoms accounted for from 3 to 9 per cent of the interruptions.

URTICARIA AND GENERALIZED EDEMA PRODUCED BY BISMUTH. P. VIGNE, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:1038 (July) 1930.

Vigne reports a case in which bismuth produced giant urticaria, generalized edema, vomiting, oliguria, acidosis, coma and death.

UNUSUAL BISMUTH ERUPTION. L. M. PAUTRIER, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:1043 (July) 1930.

Pautrier's patient had begun a second course of injections of bismuth when a papular, pruriginous, generalized eruption developed. The individual lesions resembled those of the large papular syphiloderm.

LATE BISMUTH ABSCESS. P. FERNET, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:1046 (July) 1930.

Fernet's patient developed a sterile intragluteal abscess about two years after the cessation of injections of bismuth.

BISMUTH ASTHENIA. E. SCHULMANN, Bull. Soc. franç. de dermat. et syph. (Reunion dermat., Strasbourg) **37**:1051 (July) 1930.

Asthenia due to bismuth is much more common than from mercury. It is a condition of importance and it often requires good judgment to decide whether the asthenia is caused by the bismuth or by syphilis.

The symptoms may vary; commonest is indefinite malaise with weakness on exertion. In addition, pain (headaches, arthralgia), fever or psychoses may appear. The condition is probably a heavy metal toxemia. The symptoms disappear quite rapidly when bismuth is stopped.

MICHAEL, Houston, Texas.

SUPERFICIAL FORMS OF CURED EPITHELIOMAS. J. BAJARANO, Progresos de la clín. **38**:750 (Oct.) 1930.

The term "precancerous dermatosis" is misleading and includes many conditions which are both cancerous and noncancerous. A revision in the conception

of this name is advocated. Among dermatologists, there is no unanimity of opinion on this subject.

The slight clinical and histologic changes which some authors believe to exist should not be sufficient to give a condition a new name. A plea for a simplified dermatologic terminology is made, especially since the slight differences do not influence the therapeutic course of the disease.

A review of the literature and a discussion of the various forms and classifications of epitheliomas are given. The diseases of Paget and Bowen and pagetoid epithelioma are fully discussed. An excellent bibliography of sixty references accompanies the article.

CIPOLLARO, New York.

DERMATOLOGIC ABSTRACTS

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

SYPHILITIC KIDNEY. I. BANCROFT, California & West. Med. **33**:735 (Oct.) 1930.

In the urinary examination of 350 patients with syphilis, no definite instances of syphilitic nephritis in which improvement occurred under treatment were discovered by Bancroft. Treatment with neoarsphenamine was followed by albuminuria in 3 per cent of 350 adult patients, in 12 per cent of 28 congenital syphilitic patients. Albuminuria occurred in 6 per cent of 23 syphilitic patients in whom dermatitis occurred during arsenical treatment.

INFLUENCE OF COMPLEMENT ON SENSITIVENESS OF COMPLEMENT-FIXATION TESTS FOR SYPHILIS. L. C. HAVENS and F. M. FRANK, J. Infect. Dis. **47**:100 (Aug.) 1930.

Havens and Frank assert that tests of 1,066 serums, the unit of complement obtained by titration with serum and antigen being used, yielded 45 positive results which were negative with the standard test. Agreement between the complement-fixation test, the serum unit being used, and the Kahn precipitation test was 99.4 per cent, as compared with 95 per cent agreement when the standard Kolmer test with the full unit of complement was used. In 106 treated patients with syphilis, 29 positive results were obtained with the standard test, 61 with the serum unit and 65 with the Kahn precipitation test.

TREATMENT OF ACUTE SYPHILIS WITH BISMUTH ARSPHENAMINE SULPHONATE (BISMARSEN). P. A. O'LEARY and L. A. BRUNSTING, New York State J. Med. **30**:1223 (Oct. 15) 1930.

O'Leary and Brunsting have had four years of experience in the use of bismuth arsphenamine sulphonate (bismarsen) in the treatment for syphilis, particularly of the acute phases of the disease. Of the 167 patients with acute syphilis who were started on treatment, 64 completed a series of at least 30 injections, but only 30 of these patients have been observed recently enough to warrant statistical study. Of these 30 patients, 21 have not shown evidence of clinical or serologic relapse, whereas 9 have manifested neurorelapse in the form of asymptomatic neurosyphilis. Six patients with chancre whose treatment was started while the Wassermann reaction of the blood was still negative apparently are "cured." Of 14 patients who presented seropositive primary syphilis when treatment was started, 7 have withstood the test of observation, and the condition of 7 has relapsed in one form or another. None of the 9 patients who presented asymptomatic neurosyphilis when first seen with the signs of acute syphilis manifested improvement in the condition of the spinal fluid. It is thus evident that the incidence of relapse, particularly in the nervous system, following the use of bismuth arsphenamine sulphonate is higher than with other systems of treatment previously used for acute syphilis. In those cases in which inunctions of mercury were used coin-

cidentally, no material decrease in the incidence of relapse was noted. In a smaller series of cases in which treatment has been administered more recently, decreasing the interval of time between the courses to two weeks, and giving a minimal of 40 injections, there has not been as yet any obvious change in the results of treatment. The encouragement, drawn from the response in a limited number of cases, early in their experience with bismuth arsphenamine sulphonate, has not been substantiated by longer observation in a larger series of cases. That the drug has limited value in syphilotherapy is evidenced by the results of treatment in the seronegative stage of chancre. However, the frequency of neurorelapse has been sufficiently high to offset the results in this small group.

USE OF RADON SEEDS IN TREATMENT OF CARCINOMA. H. S. SOUTTAR, Brit. M. J. **2**:273 (Aug. 23) 1930.

Eighty-five patients have been treated with radium by Souttar. In eleven cases of carcinoma of the skin the tumor disappeared, and there has been no recurrence, local or otherwise, after periods extending up to seventeen months. In the cases of carcinoma of the lip there was a rapid local response, and three of the five patients have remained well for six, thirteen and fifteen months. The one fatal case was untreatable when first seen. The cases of carcinoma of the tongue were all advanced, untreatable by any other method. In every instance, however, there was a rapid local response, with, in every case but one, a total disappearance of the primary tumor. In the four cases in which the glands were treated by radium, there was immediate response. In five of the seven cases distant secondary deposits appeared, and in only one was there any possibility of a permanent cure. This also was, however, a totally inoperable case. The six cases of carcinoma of the mouth were all entirely inoperable, five of a very advanced and extensive nature. In the only case in which the growth was limited, although surgically inoperable, there has been no recurrence after two years. In four of the other cases the local growth disappeared but recurred later. Twenty-four cases of carcinoma of the breast are classed as early, advanced but operable, and inoperable. Of the eleven patients in the first group all but one have been followed to date, and these all remain free from recurrence at periods of from six to twelve months. The twenty-six cases of carcinoma of the esophagus show beyond question that in a large proportion of cases swallowing can be achieved by means of radium, giving relief for periods up to fourteen months.

CHILBLAINS TREATED BY MELTED PARAFFIN WAX BATH AND ULTRAVIOLET RAYS. F. H. HUMPHRIS, Practitioner **125**:531 (Oct.) 1930.

The melted paraffin wax bath was introduced by the late Colonel Littlewood during the latter part of the war. Results of observations and tests have proved that this bath is of considerable therapeutic value in itself and also as a preliminary for massage and other treatment, and its properties make it an important factor in the armamentarium of modern physical therapeutics. The bath used by Humphris is made of fire-clay 3 inches thick (this is necessary to prevent radiation of the heat); it is 6 feet long, with parallel sides, white, glazed inside and over all; it is supported by four white, glazed, fire-clay pedestals, and has a stoneware draw-off tap, and is fitted up with a self-contained electrical heating apparatus and heat-regulating switch; this is fixed at the tap end of the bath and keeps the molten wax in circulation. The whole heating apparatus is enclosed in white enamel ironwork. Another bath of similar construction, but built vertically, is also used, and smaller baths for the limbs have also been constructed, but in these it is difficult to regulate the heat satisfactorily on account of their smaller capacity. Paraffin wax with a melting point of 120 F. is placed in the bath in large cakes and heated by two temporary coils of wire; when the wax is sufficiently heated, these may be removed and the bath heated at will by the permanent heaters. The patient remains with his hands or feet in the bath for about twenty minutes, at a temperature of about 120 to 130 F. At the end of this time the part under treatment is removed from the bath and allowed to cool. After two or three minutes the wax can easily be peeled off the limb.

Other conditions besides chilblains which Humphris has found to respond to this treatment include neuritis, rheumatic and gouty joints, fibrositis, especially in and around small joints, scleroderma following old lymphangitis, cramp in the calf of the leg, intermittent claudication, eczema vesiculosum, phlebitis and Raynaud's disease. Slight mechanical irritants produce bullous elevations of the epidermis over the nodules, or doughy swellings, and those blister-like formations, filled with blood-stained serous fluid, are apt to break down and form atonic ulcers which heal with difficulty and present the commonly called broken chilblain. Here the ultraviolet rays are most useful, and with their use the abraded surface readily heals. The daily application of a mild dose of the rays soon stimulates the sluggish ulcer and promotes healing, and then the cure proceeds as in the unbroken variety.

FAMILIAL HYPOTRICHOSIS DUE TO ENDOCRINE DISTURBANCES CAUSED BY CONGENITAL SYPHILIS. H. BEHDJET, Ann. d. mal. vén. **25**:493 (July) 1930.

Behdjet reports two cases of this disorder occurring in three generations and among members of one family, and in two generations in the second family. In addition to alterations in the internal secretion glands there existed also other symptoms of congenital syphilis.

INFANTILE ASTHMA, PRURIGINOUS DERMATOSES AND HEPATIC INSUFFICIENCY: INFANTILE ARTHRITISM SYNDROME. H. JUMON, Presse méd. **38**:1138 (Aug. 23) 1930.

Jumon says that asthma, certain pruriginous dermatoses and hepatic disturbances in young children form a homogeneous clinical ensemble. Although they never appear simultaneously, two or three often appear successively or even alternately in the same child and have the same pathogenesis, consisting of an alteration of nutrition, either hereditary or acquired, which predisposes the organism to factors otherwise harmless. This causes an instability of the body fluids and of the neurosympathetic system which reacts specifically in asthma, dermatoses or hepatic disturbance. These reactions are benign and tend to disappear before the age of 8 or 10 years. General methods of treatment which improve the alimentary system, and attention to diet and climatic conditions, produce the best curative results. The syndrome of this entire group of reactions may be termed the "infantile arthritism syndrome." In general, the successive appearance of two or more of these diseases in the same child is indicative of the source of the condition.

SYPHILITIC OSTEOPERIOSTITIS MISTAKEN FOR SCHLATTER'S DISEASE. A. LUPEN and S. JANU, Rev. d'orthop. **17**:334 (July) 1930.

A case, which from the roentgenogram had been interpreted as Schlatter's disease, was in reality syphilitic osteoperiostitis at the level of the head of both tibias. There was a localized gumma with local symptoms of hereditary syphilis. The Bordet-Wassermann reaction was strongly positive. Lupen and Janu administered antisyphilitic treatment, and the patient improved notably after the first series of injections.

SEMEIOLOGIC AND CLINICAL SIGNIFICANCE OF CUTANEOUS TELANGIECTASIA. P. CANALE, Riv. di clin. med. **31**:621 (June 15) 1930.

Canale carried out a series of researches on cutaneous telangiectasia, studying its presence, its topographic disposition, its possible relation to lesions, and the action of the internal organs. On the basis of such relations, clearly demonstrable in the reported cases, the genesis of cutaneous telangiectasia, together with another series of phenomena developing in the skin (vascular and trophic manifestations and pain sensations) might find its explanation in viscerocutaneous reflexes, which, starting from the wounded organ, make their impulses felt through the nervous metamere on the corresponding dermatomere.

MIXED TUMORS OF SCALP. K. H. ERB, Beitr. z. klin. Chir. **149**:617 (June 14) 1930.

Erb reports a case of tumor of the scalp over the right parietal bone apparently caused by a trauma — a fall from a ladder. Histologic examination showed that it contained mucous membrane, cartilage, bone and numerous epithelial elements — adenomatous, cylindromatous and carcinomatous. Clinically, the tumor seemed to be of the benign variety. Some neuro-epithelial elements were also found. The author assumes that an embryologic rest consisting of epithelium and periosteum was the point of origin of the tumor.

GROSSICH'S METHOD OF IODINE DISINFECTION OF SKIN. D. CURRI, Beitr. z. klin. Chir. **149**:626 (June 14) 1930.

After twenty-two years' experience with this method, Curri concludes that it is far superior to any other method. He has employed it in 20,000 operations with invariably good results. He feels that the "urge" to discover newer and, possibly, better methods has led to failure to appreciate this method at its true value.

TUBERCULOSIS OF TONGUE. G. NICOLAS, Deutsche Ztschr. f. Chir. **226**:46 (July) 1930.

This review of 217 cases by Nicolas shows that tuberculosis of the tongue occurs more often than does tuberculosis of any other structure of the mouth, including the tonsils. The left side is the usual seat of the disease; men are affected more often than women, in the ratio of about 6:1. The disease is always secondary, the infection coming through the blood or lymph stream. Primary, exogenous infection is exceedingly rare. The only treatment is excision and cauterization. The prognosis is dependent on the general condition of the patient, the stage of the primary focus, usually in the lung, and the course of the primary disease.

TREATMENT IN COLLAPSE CAUSED BY INJECTION OF ARSPHENAMINE. F. WIRZ, München. med. Wchnschr. **77**:1225 (July 18) 1930.

Wirz states that the collapse that sometimes develops after the injection of arsphenamine occasionally has a fatal outcome. He describes the clinical aspects of this condition and then discusses its pathogenesis. Postmortem examination of a patient who had died in a collapse following an injection of arsphenamine proved that the heart and the peripheral vessels were almost empty. The arteries are strongly contracted during the collapse, and the administration of circulatory stimulants is frequently ineffective. Therefore the author recommends that the vascular tonus be improved by the application of heat. He gives two case reports in which he employed this method. The patient was placed immediately in a hot bath. Already after half a minute the sallow, greenish-blue skin became reddish, the pulsation was again perceptible and consciousness returned. The patient remained in the bath for five minutes. Then he was wrapped in blankets, and camphor was administered. After several hours he had recovered sufficiently so that he was permitted to go home. Similar favorable results with the hot bath were obtained in a woman who had suffered a collapse following the injection of arsphenamine. In the conclusion, the author points out that the hot bath might also prove helpful in other forms of collapse.

TREATMENT OF ACTINOMYCOSIS WITH LYMPH NODE PREPARATIONS. F. TRAUNER, Zentralbl. f. Chir. **57**:1974 (Aug. 9) 1930.

Having noted that actinomycosis develops only in tissues free from lymph nodes, Trauner concluded that it probably would be advantageous to add to the usual treatment of this condition an injection of lymph node juice, or an extract, alcoholic or aqueous. He used mostly the cervical lymph nodes of cattle but also took some from horses. The amount was 1 or 2 Gm. of gland substance in 1 cc. of fluid. This was embodied in the dressings, instilled into the abscesses or fistulous tracts and finally was injected into the cicatricial tissue. The effect of this treatment was apparent after a few days.

Society Transactions

EIGHTH INTERNATIONAL CONGRESS OF DERMATOLOGY AND SYPHILOLOGY

S. W. Becker, M.D., Chicago, *Reporter*

Copenhagen, Denmark, Aug. 5-9, 1930

A preliminary reception was held on the evening of Monday, August 4, and the congress was opened on the morning of Tuesday, August 5, by President C. Rasch, in the presence of His Majesty the King. After addresses by Dr. Rasch, Prime Minister Stauning, Mayor Bulow, Dean Lundsgaard, Professor Darier and Secretary-General Lomholt, His Majesty shook hands with the vice-presidents and withdrew. After a short interval, the scientific session was opened. This occupied the entire days of Tuesday, Wednesday, Friday and Saturday. Thursday morning was spent in the presentation and discussion of cases at the Rigshospital. On Tuesday night a reception was held at the City Hall, with a buffet lunch and a dance. On Wednesday night the members and ladies were guests at a concert at Tivoli, a large amusement park. On Thursday afternoon the members and ladies were taken by autobus to Marienlyst Hotel for lunch, followed by a visit to Kronborg Castle at Elsinore and Frederiksborg castle. That evening a delightful musicale was given by four Danish musicians. On Friday night a banquet was held in Wivel Restaurant.

The prearranged portion of the program consisted of three symposiums: "The Etiology and Pathogenesis of Eczema," "Immunity, Reinfection and Superinfection in Syphilis" and "Cutaneous Tuberculosis and Its Treatment." Each subject was introduced by 2 reporters, followed by 6 or 7 co-reporters, and was discussed by numerous persons. This portion of the program began on the opening morning, and each symposium occupied an entire day. The free communications, 177 in number, of which 16 were announced to be read by title only and of which many more were not read, were given in 10 half-day sessions, starting on the afternoon of the first day. Papers were thus being read in 2 rooms simultaneously. The names of the current and next speaker in each room were posted in both rooms, so that one could keep informed of the progress made.

The program was conveniently divided in that all papers (eleven) referring to gonorrhea and other genito-urinary work practiced by European dermatologists were given together, and the entire voluntary program was divided roughly into dermatology and syphilology. This gave one an opportunity to choose the program in one's particular field.

A few elements detracted from the value of the presentations. Many speakers overstepped their time, necessitating the elimination of part of the papers. Of course the papers were printed either in abstract or in toto, but the presentation of photographs, photomicrographs and diagrams, often the most valuable part of the communication, had to be partly eliminated. Discussion was often eliminated entirely. This was a real loss, as the discussion cannot be published in the proceedings of the meeting.

It was evident from the meeting that one should be able to understand three languages, English, French and German. Most Italians obligingly read their papers in French, but might well have published them in one of the three languages. Discussion was confined almost entirely to French and German speaking physicians. Of course, the advantage of getting into print in Europe, especially in German-speaking countries, accounts partly for this fact. Loyalty to a particular school prompted some of the discussion.

It is interesting to enumerate the methods of presentation of dermosyphilologic material, as exemplified by the congress as a whole: (1) oral presentation; (2) abstract of talk on the screen (often in more than one language); (3) tables and charts: (*a*) lantern slides and (*b*) actual charts; (4) wax plate construction; (5) moulages; (6) lantern slides of photographs and drawings: (*a*) black and white and (*b*) colored; (7) photographs: (*a*) plain and (*b*) colored; (8) microscopic drawings: (*a*) black and white and (*b*) colored; (9) moving pictures; (10) patients (often with photographs depicting a previous condition); microscopic sections of lesions.

The element that was so prominent in the early International Congresses, namely, the presentation of material found in only one part of the world, was almost absent. The examples par excellence were Morrow's presentation of blastomycosis and coccidioidal granuloma — which was accorded the best reception of any voluntary paper heard — and Fox' paper on pinta and caraate.

There were thirty-nine exhibits (Americans presented five, and an American was collaborator in one other) consisting of moulages, plain and colored photographs, microscopic slides and charts. Dr. Howard Fox' photographs of tropical diseases deserve special mention in that they depicted conditions relatively unknown to the Europeans.

About 100 dermatologic cases were exhibited at the Rigshospital. The patients were distributed so that they were conveniently seen, and one could spend as much time examining them as one wished. Histories were written in English, French and German. Microscopic sections were abundant. Many cases of sarcoid and lupus vulgaris were presented, often with photographs depicting the previous condition. A striking feature of the cases was the presence of 5 cases of keratosis follicularis (Darier). Discussion of the cases was rather piecemeal, each speaker wandering at random and discussing any case that he was interested in. Here again, linguistic difficulty was apparent.

SYMPOSIUM ON ECZEMA

The Pathogenesis of Eczema. Dr. J. Darier.

After a rather elaborate consideration of the various factors involved and a classification based on morphology, the following conclusions were given: 1. Eczema is a special cutaneous manifestation of the intolerance of the organism to a substance which damages it. 2. The changes take place principally in the epidermis and are characterized by the process called spongiosis. 3. It matters little whether eczema is considered a disease or a syndrome; it is a vital reaction, and the phenomena of life are not easily separated into definite categories.

The Etiology and Pathogensis of Eczema. Dr. J. Jadassohn.

The subject of eczema was presented from the functional standpoint. The theory of sensitization furnishes material that can be worked on from the practical standpoint. The following conditions should be separated from eczema: (1) all pyodermias, including infectious eczematoid dermatitis, (2) eczematoid diphtheria, (3) eczematoid dermatomycosis, (4) "microbids" (bacterial and mycotic), (5) so-called seborrheic eczema and (6) the so-called lichen forms, such as neurodermatitis chronica circumscripta et desseminata (lichen Vidal, prurigo Besnier, etc.).

One should designate as eczema the acute and chronic dermatitides produced by chemical or physical agents, with the resulting characteristic histologic picture.

Although there are conditions called eczema which do not fit into any of the foregoing categories, many will be so classified as more is learned about them; this is especially true of neurodermatitis. If the patient is hypersensitive (polyvalent) to common irritants, he may have mild eczema frequently, but if he is sensitive to a certain substance, eczema develops only on exposure to that substance. The negative patch test is important in generalized neurodermatitis.

ECZEMA AND ALLERGY. DR. BLOCH, Zurich, Switzerland.

Idiosyncrasy is hypersensitiveness that exists before contact with the offending substance, and allergy is hypersensitiveness that exists after exposure to a substance as a result of the formation of specific antibodies. Dr. Bloch does not separate the infectious eczemas as Jadassohn does. The era of humoral pathology has passed, in which one sought a single cause for all eczemas in an endogenous disturbance of metabolism and "lymph." Dermatitis was produced in guinea-pigs sensitized to primrose extract by application of the extract. This opens a large field for study, especially in therapy. One of the greatest drawbacks up to the present time has been inability to reproduce eczema in animals.

ECZEMA. DR. F. KRZYSZTALOWICZ.

The study of eczema dates from the International Dermatological Congress in 1900. The dermatologist is not quiet in his scientific conscience when pronouncing the word "eczema," because he does not know just what he is talking about. The term eczema has been too inclusive; many conditions must be removed from this group. Ezcema is really a simple reaction on the part of the skin. The term "eczematoid" should not be used for all eruptions of this type because of the tradition associated with the term "eczema"; "eczematoid" might be reserved for the eczema-like eruptions found with scabies, impetigo, diabetes, etc.

In another group of these conditions, possessing the symptoms of prurigo, one speaks of toxicoderma or allergy. Here there is a "diathesis"; that is, the symptoms depend on the constitution of the patient and on the mode of reaction. Urticaria may occur in childhood, and later the lesions may become lichenified and eczematized. Occupational dermatitides are perpetuated by pyogenic organisms. Sensitization is important in all forms of eczema, but eczema cannot be considered as a disease entity.

OCCUPATIONAL ECZEMA. DR. M. OPPENHEIM.

The dermatitides may be divided into the following groups: 1. In dermatitis, *sensu strictiori,* the skin is able to deal with the irritant; almost every one's skin reacts to certain strong irritants (e. g., croton oil); even if, with slight variation, the course is acute, healing soon follows the removal of the poison. 2. In toxicoderma there is a congenital or acquired idiosyncrasy. The slightest irritant evokes it. The incubation period is short. The effect is marked and the course acute. 3. In eczema the entire skin is sensitized. For this reason the intensity of the irritant may be slight. The development of dermatitis is gradual. The course is prolonged and healing delayed.

Occupational eczema is among the most frequent of eczemas, the most frequent of skin diseases and the most frequent of all diseases. The predisposing factors are important: immersion of the hands in water, soap, alkali or acid, and the influence of heat, cold and mechanical action. Occupational eczema is allergic, but the predisposing factors mentioned play an important part. Dermatitis artificialis acuta resembles occupational eczema. The patch test has only a limited value. Attempts at desensitization have produced only slight results.

THE PATHOGENESIS OF ECZEMA. DR. W. A. PUSEY.

Eczema is dermatitis; it is not a substantive disease. When there is a balance between the capacity for resistance of the skin and the insults to which it is exposed, the skin is healthy. This balance, of course, may be upset by variations of either factor: on the one hand, by exposure to insults beyond the capacity of the normal skin to resist, or, on the other hand, by a lowered resistance of the skin, so that it reacts unfavorably to insults that the normal skin bears without apparent damage.

THE ETIOLOGY AND PATHOGENESIS OF ECZEMA. DR. R. SABOURAUD.

Dr. Sabouraud reflected the clinical outlook of French dermatologists in that he emphasized the importance of the method for relieving eczema rather than merely studying the cause of the intolerance of the skin.

THE TREATMENT FOR ECZEMA, ECZEMATOID DERMATITIS AND CERTAIN PRURITIDES BY INTRADERMAL HEMOLYSIS THERAPY. DR. R. WEISSENBACH and DR. P. SEIDMAN.

Patients were treated for eczema and related dermatoses by means of intradermal "hemolysis therapy." The blood was hemolyzed and placed in ampules. An injection was made intradermally daily for ten days and subsequently depending on the effect obtained. The condition cleared up in about 50 per cent of cases.

RECENT ADVANCES IN THE INVESTIGATION AND TREATMENT OF ALLERGIC ERUPTIONS. DR. H. W. BARBER.

In the urine of patients with allergic conditions a proteose-like substance was found that contained the specific antigenic substance. Repeated intradermal or subcutaneous injections of small amounts of the substance produced clinical improvement.

MYCOTIC ECZEMA. DR. G. PETGES.

Intertriginous (mycotic) eczema is particularly frequent in diabetes.

(In the discussion, the condition was attributed to cocci, which seem to be having a vogue in Paris.)

SPECIFIC SENSITIZATION IN ECZEMA. DR. J. G. HOPKINS and DR. B. KESTEN.

The results from scratch tests on 180 patients with chronic eczema, seborrheic dermatitis and lichen simplex Vidal were reported. A few patients were sensitive to foods and were cured by diet alone. The majority showed a specific sensitization, but definite proof of the cause of the eruption was not demonstrated. Circulating antibodies were demonstrated by the Prausnitz-Kustner method in 8 cases. Eczema in adults is rarely due to food.

THE INFLUENCE OF DIET ON SENSITIZATION. DR. R. L. MAYER and DR. M. B. SULZBERGER.

A diet of fresh grass increased the sensitization of guinea-pigs to paraphenylendiamine and neoarsphenamine and a diet of dry fodder decreased the sensitization.

ECZEMA. DR. H. MONTLAUR.

Enterococcus was cultivated from the stools of infants with eczema. Vaccine therapy yielded good results.

SOLAR ECZEMAS AND THEIR TREATMENT. DR. H. JAUSION, DR. A. PECKER and DR. R. SCHIER.

Solar eczema is due to the combination of light, a catalyzer and an antigen in a susceptible patient. This accounts for the difficulty in producing the condition experimentally. The condition was cleared up by means of sodium thiosulphate and resorcin.

HYPERSENSITIZATION TO HAIR DYES. DR. K. JAFFE.

The presence of impurities in henna hair dyes causes dermatitis. (In the discussion, indigo was mentioned as being present in some of these mixtures.)

TRUE ECZEMA OF NERVOUS ETIOLOGY. DR. A. KRISTJANSEN.

A girl, aged 14, had partially unilateral and partially segmentary eczema of the face, left side of the neck, left shoulder, left side of the breast, back and part of the left arm. Neurologic examination showed symptoms of chronic encephalitis. The dermatosis was attributed to an encephalitic process of the autonomic center of the diencephalon.

LANGERHANS CELLS. DR. C. KREIBICH.

Dr. Kreibich reviewed his work on the demonstration of the Langerhans cells of the epidermis by means of the rongalit-albumin and gold impregnation methods, and added his results with methyl green pyronin and Giemsa stains, etc. The best material was that from rapidly growing condyloma acuminatum. Elongated cells considered as Langerhans cells were demonstrated between the epidermal cells. Both Langerhans cells and melanoblasts are normal constituents of the epidermis, both being modified epidermal cells. Melanoblasts have taken over the pigment function, and Langerhans cells regulate the intra-epidermal flow of lymph.

BROOKLYN DERMATOLOGICAL SOCIETY

A. M. PERSKY, M.D., *Secretary*

Sept. 15, 1930

E. A. GAUVAIN, M.D., *Presiding*

A CASE FOR DIAGNOSIS (LUPUS ERYTHEMATOSUS?). Presented by DR. J. C. GRAHAM.

W. J., a man, aged 35, complained of a pinhead-sized, erythematous area on the right side of the nose. It had been present for three months and had been growing progressively larger until at the time of presentation it had reached the size of a ten cent piece. The lesion was treated by freezing with ethyl chloride, and it became slightly smaller. The patient presented a dime-sized, smooth, sharply outlined, dark red papule over the right side of the nose. Scarring was present.

DISCUSSION

DR. E. W. ABRAMOWITZ: This is probably a case of lupus erythematosus of a markedly telangiectatic type. The location, short duration and patulous follicles favor that diagnosis. The absence of scaling may be explained by the recent application of an ointment.

DR. B. THRONE: I do not think that it is a case of lupus erythematosus, but that it is a case of angiolupoid, such as those reported by Pautrier and Bloch. The location, the color, the absence of scaling, the dilated follicles and the ulceration are in favor of this diagnosis.

DERMATITIS HERPETIFORMIS. Presented by DR. A. WALZER.

C. R., a man, aged 71, married, had never been sick. The eruption that he presented was of seven months' duration and began as erythematous spots on the face and gradually spread to the rest of the body. At presentation, there were lesions that involved the entire trunk, face, neck and extremities; the abdomen and lumbar regions showed the least number of acute lesions. The eruption was symmetrically distributed, and consisted of erythematous and brownish pigmented patches of various sizes up to that of a ten cent piece, and vesicobullae

and bullae in various stages of development. The bullae appeared in crops and were either flabby, with clear fluid, or tense. Some of the bullae were covered with a thin crust. There was no infiltration present. The bullae were either scattered or arranged in semi-annular or serpiginous patches. Many of them reappeared at sites previously affected, either on normal or on erythematous skin. The lower lip and roof of the mouth showed healing bullous lesions. Itching was marked, and Nikolsky's sign was not present. The patient was improving at the time of presentation.

DISCUSSION

DR. B. B. BERKOWITZ: Does dermatitis herpetiformis often occur in the mouth?

DR. B. THRONE: My diagnosis would be pemphigus.

DR. E. W. ABRAMOWITZ: There are many instances on record in the dermatologic literature of cases diagnosed at first as dermatitis herpetiformis which later turned out to be pemphigus. This patient should be presented more thoroughly. Do the contents of the bullae show eosinophils? What has been the effect of the administration of iodides internally or in ointment form locally? Why not try the Macht-Pels phytopharmacologic test? Clinically, this patient shows a few bullae that have no inflammatory base. I favor the diagnosis of pemphigus vulgaris.

DR. WILLIAM H. BEST: It is queer how our observations differ on some cases. To me the lesions appeared to be distinctly herpetiform. The patient had several papular patches on his arm, the lesions being grouped in circinate arrangement and in other places being grouped vesicles. It is true that some of the lesions have an erythematous base and others have not. This is characteristic of dermatitis herpetiformis, as differentiated from erythema multiforme, in which the lesions always develop on an erythematous base, and pemphigus, in which the lesions never develop so. We have, then, in this case multiformity, herpetiformity, severe itching and pigmentation, which in my opinion favor a diagnosis of dermatitis herpetiformis more than any other disease.

DR. A. WALZER: There are three conditions that must be considered: dermatitis herpetiformis, pemphigus and multiform erythema. The differential diagnosis of these three is often difficult. In multiform erythema, the lesions are arranged in groups. In dermatitis herpetiformis, involvement of the mucous membranes, while not common, is frequently seen (up to 20 per cent of cases). The bullae in the mouth of the patient favor the diagnosis of pemphigus. He has not lost weight, and he does not show the Nikolski sign. However, the chronicity of the process, the grouping of the lesions and the two distinct types of lesions are in favor of dermatitis herpetiformis.

SPOROTRICHOSIS (?). Presented by DR. A. WALZER.

A. P., a woman, aged 28, married, had had two children, no stillbirths and no abortions. With the exception of an occasional trip to the Catskill mountains, the patient claimed that she had never been out of Brooklyn. About two and one-half years prior to presentation, following an attack of influenza, a swelling developed in the left axilla. After local treatment, the swelling was incised and drained. For the next two years, it refused to heal and continued to discharge, and within a few months after the incision of the abscess many scattered, smaller "abscesses" developed around the original one on the upper part of the left arm and on the chest. All of these lesions were persistent, but they eventually healed in about six months. Similar lesions developed on the right arm and had been persistent since. She was given heavy doses of potassium iodide and appeared to be improving.

At the time of presentation, there were many dime-sized, boggy, subcutaneous lesions which were dark red and not tender, but many of them had tiny openings through which a thick seropus discharged. Each of these lesions was separate, with little surrounding erythema.

DISCUSSION

DR. E. A. GAUVAIN: I think the case is one of tuberculosis of the skin, for it is the only disease in which I have seen the type of cutaneous bridge work presented by the patient. As her lesions heal, we have the definite bridges of epithelium which I have seen only in tuberculosis of the skin.

DR. M. J. CANTOR: I saw this patient several months before presentation, and at that time she showed no injury to her fingers or hand.

DR. E. W. ABRAMOWITZ: I do not hesitate to make a diagnosis of nodular tertiary syphilis. I do not at all see where the question of sporotrichosis arises.

DR. A. WALZER: When first seen, the patient had soft, boggy lesions, not nodules, and some of these were surmounted with sinuses which discharged a serosanguineous pus. Smears of the discharge were negative. While a positive diagnosis would have to depend on a positive smear or biopsy, a clinical diagnosis would rest between sporotrichosis and blastomycosis.

METALLIC DERMATITIS. Presented by DR. B. THRONE.

R., a Jew, aged 40, was shown at the May meeting of the New York Dermatological Society. At that time a chemical examination of the skin had not been done.

At presentation his general condition had enormously improved, the skin was practically normal except for the discoloration, and this was becoming gradually less. He complained of slight attacks of pruritus. His urine was positive for arsenic. In order to determine if arsenic in the skin was responsible for any of the pigmentation, a piece was excised and examined. It showed 1.018 mg. in 100 Gm. of skin. A determination of silver had not yet been completed.

Treatment had consisted of intravenous injections of freshly prepared sodium thiosulphate.

DISCUSSION

DR. E. W. ABRAMOWITZ: I saw this patient about three years before presentation, and at that time he had a generalized dermatitis with a deep brown pigmentation, involving the entire cutaneous surface. I saw him again about one year before presentation, just after he returned to this country after being under the care of the late Professor Unna. I wish to congratulate Dr. Throne on the result he has obtained. The patient now shows practically no inflammatory lesions, and the pigmentation, although still marked, is much paler than it was when I saw him last. If this is a case of arsenical melanoderma, it will be interesting to see if the patient will later develop arsenical keratoses.

DR. B. THRONE: I presented this patient for two reasons: to show the effect of treatment and to bring forward proof that the pigmentation is at least partially due to a retention of arsenic in his skin. His history shows that he received two or more injections of a colloidal silver preparation, and the part which this played in the production of the discoloration of the skin cannot be stated until this analysis has been made. The treatment, as was stated, consisted in the injections of 1 Gm. of a freshly prepared solution of sodium thiosulphate three times a week.

GRANULOMA ANNULARE. Presented by DR. B. B. BERKOWITZ.

P. S., aged 3 years, presented four circular patches, varying from 0.5 to 2.5 cm. in diameter, on the dorsum of the left hand near the wrist. These patches were elevated and made up of small nodules varying in size from that of a pinhead to that of a split pea that coalesced and had a slightly erythematous base. The centers of the patches were depressed. The patient had received three treatments with ultraviolet rays, and improvement was noted.

PHILADELPHIA DERMATOLOGICAL SOCIETY

J. P. GUEQUIERRE, M.D., *Secretary*

Friday, Oct. 3, 1930

JAY F. SCHAMBERG, M.D., *Presiding for* DR. WRIGHT

A PATCH OF CHRONIC DERMATITIS IN WHICH A DIAGNOSIS OF TUBERCULOSIS AND FUNGUS INFECTION MAY BE ELIMINATED. Presented by DR. PATRICIA DRANT.

A. F., a white boy, aged 18, two years before presentation had a lesion on the posterior surface of the left calf similar to but smaller than the one now present on his right calf. Because the first lesion did not respond to ordinary forms of treatment, it was excised. Histologic examination showed chronic inflammatory tissue. One year and a half before presentation, the present lesion developed on his right calf. The lesion is a sharply marginated, vesiculated, bluish patch, superficially eroded in the center, measuring approximately 3 by 2 cm. The production of vesicles is a comparatively new phase.

There was no history of the use of drugs or occupational irritation. The results of the examinations for the fungus, both in potash and culture à la Weidman, were negative. Histologic section showed chronic inflammatory tissue.

DISCUSSION

DR. JOHN H. STOKES: I should say that clinically the boy has an eczematoid dermatophytosis. Between the toes there is soggy, macerated epidermis; the sole of the foot is hyperhidrotic. I could not get much out of the section. I did not find the epidermis on it; the part that I saw was fragmented.

DR. F. D. WEIDMAN: I saw the patient a week before presentation. At that time the appearance of the lesion was not nearly what it is at present. Vesicles were confined to the periphery. It looked even more like a dermatophytosis then than it does now, for there is more general edema and vesiculation through the entire lesion tonight. It just occurred to me that with such a pronounced change in the case in spite of the absence of treatment in the meanwhile, a factitial factor might be present. At the same time that does not entirely explain it, because the lesion as it appeared a few days ago could not have been factitial.

A CASE FOR DIAGNOSIS. Presented by DR. A. STRAUSS for DR. E. F. CORSON.

O. W., a German boatman, aged 47, had recently been dredging mussels in the harbor at Ocean City, N. J., into which much sewage is discharged. Three weeks before presentation he noticed a small red papule on the dorsum of his right hand. It rapidly developed purulent contents, marked swelling around the lesion and a tendency to spread at the periphery. There were no general symptoms, and his temperature did not rise higher than 99.4 F. While the marginate pustule was still advancing, the center became necrotic, and a second area, similar to the first, appeared on the left forearm. When first seen by us a week before presentation, there was a third incipient spot on the right wrist. The epitrochlear and axillary glands were not enlarged. There was no history of handling hides, hair, etc. The Wassermann reaction was negative. The appearance and course of the lesions did not favor the diagnosis of dermatitis factitia. No medicines had been taken before the outbreak. Culture of the pustule showed *Staphylococcus aureus* and a gram-negative bacillus that proved to be *Bacillus faecalis-alcaligenes.*

On presentation, as a result of treatment with a diluted solution of chlorinated soda, the two later areas had healed, and the earlier lesion was a deep excavation 2½ inches (6.3 cm.) in diameter, showing steady improvement.

DISCUSSION

DR. JOHN H. STOKES: A number of years ago among the men delegated to collect specimens from the tide-shoals of one of the marine biologic stations, I think, there was an outbreak of this sort. The multiple impetiginous and gangrenous lesions appeared from the knee down, the men having waded through the water to their knees. One of them came to my clinic; we labored a whole summer to cure the infection. The lesions are extremely resistant to treatment. At the beginning the patient had fever, but he recovered satisfactorily. Fishermen who haul trawls along the Jersey coast are known to have infections of the hands that belong to the type of erysipeloid which Dr. Klauder has already described. I have been told that gangrenous ulcers sometimes develop in these persons. Of course, one would think of a factitial element here, but this patient's type of dermatosis is not in keeping with such a diagnosis.

DR. JAY F. SCHAMBERG: What laboratory examinations have been made here?

DR. A. STRAUSS: Cultures and smears were taken. *Bacillus alcaligenes* and one of the colon group, *Staphylococcus albus,* were grown. The staphylococcus was the only growth in the anaerobic culture.

DR. JAY F. SCHAMBERG: Like Dr. Stokes, on account of the patient's contact with mussels, I had in mind the possibility of the swine erysipelas infection which Dr. Klauder and Dr. Harkins studied in connection with infections of the hands in fishermen. I have never seen ulcerations of this kind occur from this infection. Ordinarily the condition one sees resembles more the erysipeloid of Rosenbach, although some of the eruptions are more severe. I am not quite sure from the literature whether cases with deep ulceration have been described. Dr. Klauder and Dr. Harkins were able to recover the bacillus of swine erysipelas by excising part of the tissue and culturing from that. I would suggest that after proper cleansing of the parts, a portion of the tissue be excised and cultivated to determine whether or not the bacillus of swine erysipelas can be recovered. This disease is not uncommon among hogs in the abattoirs of Chicago, where this bacillus produces an unusual disease called the "diamond spot disease." I have seen specimens of the skin from that; the lesions look more like reactions from a plaque of radium than anything else. There is distinct rectangular bluish-red discoloration, the angularity of it being rarely seen in any spontaneous disease of the skin. Of course, it is conceivable too that some other organisms which have not been found might be the cause of this. One might think of the possibility of the ameba; it has been known to produce ulcerations of the skin or even a colon bacillus. I think a further and more intensive bacterial study would be in order here.

DR. A. STRAUSS: When we first saw this lesion, it closely resembled a lye burn, the factitious lye burn; *Bacillus alcaligenes* eleborates great amounts of alkali, which may account more or less for the lesion resembling an alkaline burn.

BLASTOMYCOSIS. Presented by DR. F. D. WEIDMAN, service of DR. ULLMAN.

The patient was in the tuberculosis wards of the Philadelphia General Hospital for several months, and was at first thought to have pulmonary tuberculosis. He had a number of ulcers over the chest and a rather large one on the ear and back of the neck, which, when I first saw him two or three weeks before presentation, had the typical verrucous, suppurative qualities of blastomycosis. However, that diagnosis had been made long before as a result of laboratory examination of the pus. This is, then, a case of blastomycosis originally suspected to be tuberculosis. From the history it appears that the pulmonary preceded the cutaneous involvement, for in the roentgenograms a large mass may be seen on the right side. This is in keeping with the trend of modern thought that most of these cases are visceral before they are cutaneous. Under treatment with 60 grains (4 Gm.) of iodide three times a day, the lesions are regressing.

DISCUSSION

DR. B. KAHN: I saw this patient in the latter part of July. The lesions were about three times the size that they are now, and the diagnosis made at that time was blastomycosis.

DR. F. D. WEIDMAN: I forgot to mention a large, fluctuating, subcutaneous abscess on the back of this patient from which 40 cc. of pus was aspirated, and over which there were no dermal changes. This reminds me of a fluctuating abscess that was found at autopsy in a case of coccidioidal granuloma that I saw last year in Del Monte; this observation shows more clearly the close association of the two diseases. This patient from Philadelphia was examined for tuberculosis; the internists thought it impossible that he did not have tuberculosis, and adhered to that diagnosis in spite of the diagnosis that must have come up after Dr. Kahn saw him.

DR. JOHN H. STOKES: It might be interesting to remark on the treatment given patients with blastomycosis. During the illness of a famous American dermatologist, I wrote to all of the dermatologists in the Middle West who had seen a considerable amount of blastomycosis and asked them to express their opinions on the most efficacious methods of treatment. I have not looked up the documents recently so that I cannot give the tabulated results of the census at this meeting, but I recall several striking utterances. Dr. Ormsby said that one of the most efficacious single elements in treatment that he knew of was the constitutional treatment for tuberculosis. Seemingly hopeless cases may respond to a change of climate, such as can be found in the southwestern United States or southern California. I recall that several of the dermatologists endorsed neoarsphenamine, the general efficacy of roentgen rays and the use of the quartz lamp as being of material assistance. In previous advice on severe cases, Dr. Ormsby said that practically all patients with blastomycosis would recover if given enough iodide. His conception of enough iodide seemed even to approach 500 grains (32.5 Gm.) three times a day. I have felt, however, probably without sufficient grounds, that sometimes patients do not progress as well under such enormous doses of iodide as they do under more moderate doses. Another item experience taught me is to use two or three large doses of roentgen rays in most instances instead of a number of small doses. Last year Osborne, of Buffalo, confirmed my impression. A dose of from 2 to 3 skin units to a blastomycosis will frequently ablate it completely; complete resolution will take place, such as occurs in an epithelioma. I think that it is interesting, as Dr. Weidman has pointed out, that these cases are systemic before they become cutaneous; we will not be quite so timid about excision of the lesions for fear of generalizing the infection. The disease shows a tendency to appear at a locus minoris resistentiae following trauma. By prostatic massage, one may produce a blastomycotic prostatitis. I remember very well that Fred Harris first observed the effect of neoarsphenamine on these lesions and was convinced that the drug was almost as specific for blastomycosis as it is for syphilis. Having seen its action, I would certainly want to have it used on me if I were a victim of the infection.

A CASE PRESENTED FOR DIFFERENTIAL DIAGNOSIS BETWEEN YAWS AND SYPHILIS. Presented by DR. ROBERT GILMAN.

Y. F., a man, aged 40, was admitted to Dr. McKinney's service of the Philadelphia General Hospital, in the middle of September. At the end of June there appeared a large, fungating, rapidly growing lesion on the left cheek anterior to the ear. Three years before that time, a small pimple had been injured by shaving. He believed that this lesion was at the site of the previous "pimple." On admission to the hospital, he had a large fungating patch on the left cheek and through the scalp several lesions, with lesions around the mouth and chin which were pustular with some crusting. There were a few lesions on the body, some corneous pitting on the palms, and about the perineum and scrotum there were moist hypertrophic papules. Results of the examination for spirochetes were

positive. The complement-fixation test and the Kahn test were strongly positive. After treatment with 0.6 Gm. of neoarsphenamine, the lesion involuted. It was at least 70 per cent involuted in a week. Since that time one more injection of neoarsphenamine was given. We were unable to elicit a history or find any remains of a primary lesion. Possibly, if this is yaws, the lesion on the left cheek may stand as the so-called "mother plaque." An interesting feature of the biopsy was the presence of epidermal abscesses.

DISCUSSION

DR. F. D. WEIDMAN: I saw this patient before he had received any intravenous medication, and the lesions at that time were superficial, highly elevated and deeply crusted. One could obtain a very narrow margin of infiltration around the edge — somewhat like that which one sees in carcinoma, not the wide, dusky margin one is apt to see in the common run of syphilitic lesions — and the lesion in front of the ear was verrucous and recalled the appearance of blastomycosis. However, the appearance of the mucous patches on the back of the scrotum and on the perineum was the deciding point, it seemed to me, to make the case clinically appear to be frambesiform syphilis.

The sections under the microscope tonight, showing clearcut intra-epidermal abscesses, have the histologic picture of yaws. I distinctly recall the paper which Dr. Schamberg and Dr. Klauder read on a case of frambesia, and I have never been satisfied that the histologic appearance was a criterion for the differential diagnosis of those two conditions; that is why I performed a biopsy on this patient. In an ordinary nodular syphilitic lesion in which secondary infection comparable to the process in yaws is going on — acute exudative processes — it seemed to me that there was likely to occur a similar order of histology, that is, the same in a frambesiform syphilid as in a real case of yaws. I think such has turned out to be the case. If this patient has frambesiform syphilis rather than yaws, it seems that this section clinches the matter. Dr. J. Earl Ash, head of the Army Medical Museum, at one time active in the army, has been in the Philippines and has seen a good deal of frambesia. He happened in the laboratory yesterday, and I showed him this section and one from a case of yaws which Major Callender had presented to me; we compared them, and he conceded that it would be difficult, if not impossible, to distinguish between the two processes. The Levaditi sections did not show spirochetes in the intradermal abscesses. Dr. Ash also told me something new about the value of cross-inoculation in monkeys as a means of distinguishing between these two diseases. It appears that that prop was becoming rather frail; as a result of tests on monkeys in the Philippines, it was found that, provided the examinations were made at certain appropriate times in the development of the experimental disease in the animals, one could get a similar behavior on the part of yaws and of syphilis; that is, that a syphilitic monkey would become refractory to yaws and vice versa. This, of course, was a decided shock to us, for we have been dependent on what we thought was laboratory help in the differential diagnosis between syphilis and yaws.

DR. D. M. SIDLICK: I believe that this is a clinical illustration of a case in which a pyogenic infection has been added to a syphilitic background. I base my assertion on the history of the patient. He has lost 20 pounds (9 Kg.) since July. He drinks heavily and eats little. Although the lesions have involuted considerably, the clinical appearance of the remaining lesions favors the diagnosis of syphilis to which a pyogenic dermatitis has been added.

DR. JOHN H. STOKES: I think that Dr. Sidlick's point deserves emphasis. In San Diego I recently saw a sailor with syphilis and frambesiform vegetative lesions of the palms and around the ankles who had never been in the tropics. Although he had syphilis, I felt satisfied, after examining the lesions thoroughly, that he had a vegetative dermatophytosis, not a frambesiform syphilid.

DR. S. S. GREENBAUM: The rapidity with which these frambesiform lesions disappeared after treatment with neoarsphenamine is not in favor of their being

in the nature of yaws. I recall a colored girl with frambesiform syphilids on the chin, who was inadvertently given 1.2 Gm. of neoarsphenamine intravenously. Within one week only slightly crusted, pigmented lesions remained. Frambesiform syphilids respond quickly to the arsphenamines.

Dr. Jay F. Schamberg: I believe that it is extremely difficult in this case from the presentation of all the evidence to state definitely whether one is dealing with a frambesiform syphilid or with yaws. The lesions are numerically sparse for secondary syphilis, and the patient showed fungating lesions similar to those seen in yaws. Of course, he has not been in a country in which yaws is indigenous, but there are instances in which yaws has developed here and in other countries in which it is not commonly found. The finding of epidermal abscesses is a matter of extreme importance. I recall that when I presented my case in Asheville, Professor Linderman of South America was there. When he saw the section projected on the screen, he said that he should regard it as complete confirmation of the diagnosis of yaws. He said that in South America they would regard such evidence as entirely convincing. I notice in the section that the area of epidermis in which abscesses are present has lost its covering as if it had been taken from an ulcerated area. I believe that the diagnosis here can be cleared up by means seldom referred to in the literature. We referred to it in our paper some years ago. If no further treatment is given and a careful watch is kept on the Wassermann test, you will find that if the disease is yaws, the Wassermann reaction will become gradually weaker and will finally become negative. If it is syphilis, that will not be true. There was until a few years ago an extraordinary paucity of information on the behavior of the Wassermann reaction after several injections of neoarsphenamine in patients with yaws, but we followed up our case in that way and found that the Wassermann reaction became weaker and weaker and finally became negative. Whereas, of course, in syphilis it would not become negative after such inadequate treatment. I believe that it would be justifiable in this case to carry out that procedure. If one had carried out inoculations into rabbits one might have gotten a successful reaction in those with yaws, but it is much more difficult to propagate yaws continuously in series in rabbits than it is syphilis. I recall that I gave a rabbit infected with yaws to Dr. Noguchi and Colonel Nichol of the United States Army, and neither in their laboratory nor in ours were we able to continue the strain after several passages.

An Unusual Case of Cyst. Presented by Dr. E. F. Corson.

C. B., a boy, aged 14, had always presented a small aperture in front of the tragus of the right ear. Four years before presentation an area the size of a finger-nail and anterior to this opening swelled up, became red and discharged purulent material. This has periodically occurred ever since in spite of many sorts of treatment. A probe can be inserted into the opening which appears to lead into a sac underneath the outbreak. The condition has frequently been noted and is believed to be a malformation in the development of the first bronchial arch. Surgical intervention is the suggested treatment.

DISCUSSION

Dr. F. D. Weidman: I agree with the theory as to the pathogenesis of these cysts; the line of closure, of course, extends up to a point just beneath the ear. In Dr. Bland Sutton's little book "Tumors Innocent and Malignant," these inclusion cysts are also pictured at the inner canthus of the eye. I have seen three instances of cysts inside of the mouth, in the mucous membrane just back of the angle of the mouth. In dogs it is well known that at times small warts appear externally on the cheek on the line of this closure. Fordyce's disease of the mouth also occurs along this line.

Dr. A. Strauss: This patient has been operated on three times.

Dr. John H. Stokes: I think that it is sometimes well to cultivate the pus from these lesions. I have seen two or three; one in particular that I recall,

from which *Streptothrix* was grown, occurred a little farther down on the face. I think that this is a fairly typical dermal cyst.

ACNE KERATIQUE OF TENNESON. Presented by DR. PATRICIA DRANT.

J. F., a white man, aged 50, presented circumscribed, symmetrical, bilateral patches, situated over the trochanters, the lateral surface of the knees and immediately above the knees. These areas, which were approximately 3 by 4 cm., consisted of hypertrophied, slightly elevated follicles, with corneous plugs protruding from the pilosebaceous orifices. From some of the newly affected follicles dry brittle hairs protruded.

The condition developed two years before presentation and responded promptly to the application of 2 per cent salicylic acid ointment. The condition recurred after several months. The patient's right eye did not react to light, the left eye reacted sluggishly, and the pupils were unequal. The Wassermann reaction was 4 plus. Results of the physical examination otherwise were negative. (NOTE: The histologic section was submitted to the society for examination.)

DISCUSSION

DR. D. M. SIDLICK: My impression has been that lichen spinulosus is characterized by a fine, follicular eruption present about the trunk, the so-called protruding spines of which are delicate and slender. Here we are dealing with a markedly inflammatory, follicular eruption characterized by patches and orifices that are filled by plugs instead of slender spines. I cannot quite subscribe to the diagnosis of lichen spinulosus.

DR. F. D. WEIDMAN: I was going to make much the same remark, namely, that the cases I had seen had long, slender tendrils more sharply defined. I looked up some of the synonyms under the heading of lichen spinulosus and found that the acne cornée en aires of Hallopeau was included. Without going into the literature exhaustively, it is probable that the group of lichen spinulosus contains other than the long, narrow type. We all agree that this is not of that type, but as far as the keratosis and the obvious infiltration around it, shown by the microscope, are concerned it comes in the same category. I do not think that any of you care very much what name is applied to the disease, whether or not it is of internal or external origin is the important phase. It seems to me that from its bilateral and symmetrical nature it is endogenous. I ventured the same opinion when I saw the sections, on account of the close and uniform packed type of the lymphocytes and their sharply marginated contours. Of course, this patient has syphilis. I think that this case of keratosis is an expression of something internal. A hair can be seen in any of these plugs; this confirmed by the microscope.

SYPHILID APPEARING AFTER MALARIAL AND TRYPARSAMIDE TREATMENT. Presented by DR. J. V. KLAUDER.

In June a woman, aged 24, presented an acute mental picture. She was admitted to the Philadelphia General Hospital with a diagnosis of manic-depressive psychosis. The Wassermann reaction of the blood and the results of the examination of the spinal fluid were positive, with a paretic colloidal gold curve. In view of those observations, an inoculation of malaria was used, followed by tryparsamide, the last injection being given on August 28. The patient had seven chills. Several weeks after that, about a month before presentation, infiltrated, maculopapular, circinate lesions developed on the forearms, which clinically were regarded as late secondary syphilis. The lesions suggested the so-called neurosyphilid described by Unna.

DISCUSSION

DR. JOHN H. STOKES: I think that this is one of the most unusual cases presented during the evening. I am inclined to agree with Dr. Klauder that this

is a late syphilid. Because of the noninhibitive effect of tryparsamide on the general syphilitic infection, all malarial treatment should be followed by neoarsphenamine before tryparsamide is given.

DR. S. S. GREENBAUM: I wish to emphasize the remarks of Dr. Stokes on the effects of antisyphilitic therapy on syphilitic lesions. Several years ago, Dr. Schamberg and I reported our results with malaria in the treatment for cerebrospinal and other forms of syphilis. Two of our patients had ulcerative tertiary lesions. The lesions had healed by the end of the malarial course, but within three weeks they had broken down again. Therefore, antisyphilitic therapy, even the most powerful, only temporarily heals syphilitic lesions. I feel that malarial treatment should be followed by regular antisyphilitic therapy, but not for from six to twelve weeks after such treatment, for reasons noted in our original report.

DR. J. V. KLAUDER: An analysis of the patient's history shows that the first symptom was headache, then drowsiness and finally the onset of a semistuporous stage. Considering that and this type of lesion, I would suspect that she had an acute case of meningeal neurosyphilis. In view of the mental picture and positive spinal fluid, malarial treatment was suggested by those having her in charge. I do not believe that this patient was a proper candidate for malarial inoculation, for acute meningeal neurosyphilis responds readily to other forms of antisyphilitic treatment. I think that, having employed malaria, however, it was a mistake not to follow it by a more active syphilitic drug than tryparsamide.

DR. L. E. STROHM: In these cases of cerebrospinal syphilis in which malaria is used, Dr. Otto Kren stated that in Vienna all malarial treatment is followed by treatment with arsphenamine, and the results are much better than if no arsenical treatment is used after the malarial inoculations. I remember reading in Gerstmann's book that in all cases of cerebrospinal syphilis in which the patients are treated with malaria that treatment should be followed by regular courses of arsphenamine.

DR. JAY F. SCHAMBERG: In the first edition of Gerstmann's book, he stated that they had taken a series of cases of malarial inoculation, and in one group had given the patients subsequent antisyphilitic arsenical treatment, while in the other group they had not. As far as they could determine, the group receiving no subsequent treatment progressed, if anything, a little better than the other; but since that time they have revised their opinion, and now definitely insist on arsenical treatment subsequent to malarial inoculation. I agree with Dr. Klauder that this patient was suffering from some early form of meningeal syphilis. It is obvious that she was not suffering from dementia paralytica, or she would not have a recurrence of the neurotic manifestation at this time. Perhaps not the malaria but neglect of treatment may be responsible for this condition. In fact, I do not believe that malaria is contraindicated in early meningeal syphilis. I agree with Dr. Klauder's diagnosis, with which Dr. Stokes is also in accord. The rather circinate patches on the arm are suggestive of neurosyphilids.

A CASE FOR DIFFERENTIAL DIAGNOSIS BETWEEN LEPROSY AND SYPHILIS. Presented by DR. RHODES.

A Japanese man, aged 34, from Dr. H. Smith's clinic, complained of burning sensation of the fourth and fifth fingers of both hands and general malaise. He complained also of cardial pain. He gave a history of a chancre about fifteen years before presentation, which was treated for three years, at which time some of the present lesions which show on his chest, legs and arms — thin, atrophic scars with a great deal of brown pigment on the outer border, some rather shaded in the center — were present. There was no particular sensory disturbance in any of these lesions. Subcutaneous nodules developed on the flexor surface of both arms and above both knees. The Kolmer-Wassermann reaction was anticomplementary, and the Kahn reaction, negative. The nerves were not palpable or sensitive. There was wasting of both forearms and of the intrinsic muscles of both

hands. The patient stated that the amputation of one finger was an accident. All nasal smears were negative.

DISCUSSION

DR. D. M. SIDLICK: Negative smears do not exclude the diagnosis of leprosy. It is known that the bacillus is more commonly found at the time of an acute exacerbation of the disease. In chronic, long-standing leprosy the bacillus may not appear in smears from the nasal mucosa. From the general appearance of the lesions of this patient, I should judge them to be of macular atrophy due to syphilis rather than to leprosy.

DR. JOHN H. STOKES: I am going on record as against the diagnosis of leprosy in this case. It is unusual to see the combined anesthetic and nodular type of leprosy without finding some infiltration of the face. The deep subcutaneous nodules on the arms are not sufficiently infiltrated, nor do they correspond to the lesion of anesthetic type which should accompany the symptoms of degeneration and injury of the nerves which the patient presents. The multiple, superficial, fibromatous nodules on the left arm remind me of a patient, a young girl, who had neurofibroma along the course of the ulnar nerve. These neurofibromas were tender to pressure, and the nerve itself was evidently affected, for there were marked paresthesias affecting this part of the arm. Obviously this patient has some form of peripheral neuritis, but I do not think that it is necessary to call on either syphilis or leprosy to explain it. The man, moreover, has Crommelschlager. The scarring on his legs is to me much more suggestive of tuberculosis or a tuberculid than of syphilis or leprosy. It seems to me that a roentgenogram of his chest is essential to determine evidence of mediastinal infiltration, and that his cardiovascular system, particularly the aortic arch, should also be studied.

I might record at this point something that may be of interest to all of you. Recently, Admiral Stitt at the United States Naval Hospital in San Diego told me that he was quite satisfied that many of the positive Wassermann reactions of the blood, which were reported earlier in investigations of the specificity of the Wassermann test in leprosy, were in reality due to latent yaws. Dr. Stitt called my attention to the fact that many leprous patients have yaws, and that the earlier work in fixing was done in hospitals and leprosaria, such as that at Molokai, where both diseases were undoubtedly present. He stated that untreated yaws carries a positive Wassermann reaction of the blood for many years, as does syphilis, and that this was in all probability the source of the original impression of nonspecificity of the Wassermann reaction in leprosy. When Kolmer and Dennie carried through their work at the leprosaria in Carrville, they did not have to contend with the confusing factor of yaws, and accordingly the Kolmer test appeared to have a much higher specificity than had been obtained with any other modification of the Wassermann test up to that time. I simply offer you these observations as an interesting sidelight from the experience of one who, like Admiral Stitt, has a wide acquaintance with tropical disease.

DR. JAY F. SCHAMBERG: This patient obviously has peripheral neuritis, affecting particularly the ulnar nerves, with some atrophy of the interosseous muscles and, of course, needing clarification as to origin. He has no cutaneous symptoms that could be identified as leprosy. The scars on his legs look to me as though they were the result of syphilis. They are sharply marginated and pigmented; and seem rather of syphilitic than of other origin. I presume that there is nothing in the history of recent arsenical treatment to account for arsenical neuritis. If the diagnosis cannot be cleared up in any other way, it might be justifiable for a surgeon to take a longitudinal sliver from one of the ulnar nerves and have that studied for bacilli. If the case is one of leprosy, bacilli should be present there. I think that the data for the diagnosis of leprosy are inadequate. The case is still a casus pro diagnosi.

SEBACEOUS CYSTS OF THE NEVIC TYPE. Presented by DR. S. S. GREENBAUM.

S. H., a woman, aged 33, had from thirty to forty lesions on the anterior and posterior parts of her chest for the ten years previous to presentation which were lentil sized, slightly elevated and skin colored.

DISCUSSION

DR. F. D. WEIDMAN: In view of the distribution and the size of the lesions, the first diagnosis, I suppose, that occurs to every one is syringoma, but even in this light the lesions appear to be much too yellow for that condition. I should like to know how they appear in daylight. There are black punctae in the center of some of them, such as are seen in syringoma. I think that a biopsy to eliminate that possibility would be worth while. If these are sebaceous cysts, I should say that the similarity of distribution with that of the sweat glands in syringoma is most striking and would make one wonder what the nevoid factor could be to determine such a similar distribution.

DR. S. S. GREENBAUM: When I first examined the patient I also thought that she had syringocystoma. On closer examination, I was not so certain, and, on puncturing one of the lesions, I was able to express so much sebaceous material that the lesion was almost completely collapsed.

MORPHEA. Presented by DR. D. M. SIDLICK for DR. E. F. CORSON.

A case of morphea in a girl, aged 10, was presented.

DISCUSSION

DR. A. STRAUSS: I am not sure of Dr. Corson's exact reason in presenting this case. I think that he presented it to obtain suggestions as to treatment. He has had remarkable success in a case of scleroderma in a child in which he used intravenous typhoid therapy for a week or ten days, followed by injections of fibrolysin. I think that he wanted to learn if any of the members had used the treatment or had had success with any other form of treatment. In the patient whom he treated successfully, the sclerodermatous lesions disappeared, and the use of the limbs, which had been practically locked by the extensive sclerodermatous process, returned.

DR. JAY F. SCHAMBERG: Of course, every one is in accord with the diagnosis that has been made.

LOUISIANA DERMATOLOGICAL SOCIETY

R. A. ORIOL, M.D., *Secretary*

Monthly Meeting, Oct. 6, 1930

T. A. MAXWELL, M.D., *President*

LICHEN PLANUS HYPERTROPHICUS. Presented by Dr. M. T. VAN STUDDIFORD.

L. K., a Negro, employed in a paper mill, aged 61, who presented lesions, gave a history of handling alkalis, used for bleaching purposes. Three weeks previous to admission to our service he stopped work, and during this period applied salves and lotions to the lesions. He appeared to have a typical occupational dermatitis. His legs, arms, neck and back were much inflamed; so much so, that he was given wet packs of boric acid continuously. After this acute condition cleared up, he presented very nearly a typical lichen planus hypertrophicus, and although this is of several weeks' duration, he still has lesions which give the appearance of lichen planus hypertrophicus. I think that the only other lesion with which one could

confuse it would be epidermophytosis, as a Negro's skin so often becomes hypertrophic on the least irritation. I believe that sections will show that the condition is lichen planus hypertrophicus.

DISCUSSION

DR. HOPKINS: My impression is that this is lichen planus hypertrophicus. The fact that the man had a dermatitis venenata before the lichen appeared is not at all against the diagnosis of lichen. I recall seeing a case of scabies in which, subsequently to the curing of the scabies, the patches of lichen planus developed in a good many of the lesions where the scabies had been.

DR. R. A. ORIOL: Looking at the lesions for the first time, under artificial light, I cannot attempt a diagnosis, but they seem to me to have all the earmarks of lichen planus hypertrophicus. It may be a superimposed dermatitis that produces this pigmentation and scaliness, but in some parts of the body one sees lesions that are typical of lichen.

DR. T. A. MAXWELL: I referred this man for treatment with a diagnosis of occupational dermatitis. He came in with an irritated skin, plus a secondary infection, and a good deal of lichenification. I would not call this lichen planus hypertrophicus, but a lichenification due to the results of a chronic dermatitis caused by some external agent. The demarcation of the lesions might lead one to consider chronic epidermophytosis which has resulted in lichenification.

DIFFUSE SCLERODERMA. Presented by DR. R. A. ORIOL.

J. T., aged 14, was first seen eight months before presentation, at which time she gave a history of having noticed a thickening of the skin two years previously, and of the condition being progressive. Her skin, in places, was considerably harder than it is now, but the disease continues to spread. In diagnosing the case, syphilis and leprosy may be eliminated. The Wassermann reaction and scrapings for Hansen's bacilli were negative. In testing for anesthesia, sensation was good, except in one area, a hard spot, the lessened sensibility being undoubtedly due to the thickness of the skin.

The treatment instituted eight months previously, except for gradually increasing the amounts of solution of potassium arsenite and thyroid extract, has never varied. Five drops of the solution of potassium arsenite was given in the beginning, then increased to 10 drops a day; ¼ grain (16 mg.) of thyroid was given three times a day and increased to 4 grains (0.26 Gm.) a day at the present time. She is also taking large doses of cod liver oil and sodium salicylate. As a local application, turpentine salve with betanaphthol is used.

What is the prognosis in this case? What is the most effective treatment? I have searched the literature for helpful suggestions, but find nothing to add to the foregoing treatment. The softening of the old lesions encourages me to hope that I may be able to do somthing for her. Her metabolic rate, which was minus 13, is now minus 3.

DISCUSSION

DR. M. T. VAN STUDDIFORD: I agree with the diagnosis of scleroderma. In the history of the case Dr. Oriol states that the basal metabolic rate was minus 13. A minus metabolic rate is really more minus than the first reading of the test indicates, because the patient is nervous and uses up more oxygen than he would normally. Dr. Seale, in Houston, is trying glandular extracts in these cases. This patient is receiving thyroid extract. I would suggest adding suprarenal extract, and trying pituitary extract with the thyroid.

DR. FAUST: I have nothing to add, but I think Dr. Oriol's method of handling the case is giving good results. The original patches seem to be much better than they were, and he certainly is utilizing the procedure which is indicated in this case.

A Case of Blastomycosis (?) or Rhinosporidium (?), to be Determined by Laboratory Study. Presented by Dr. M. T. Van Studdiford.

P. D., aged 58, in August, 1929, was given roentgen therapy for a small lesion involving a slight portion of the ala of the nose and the mucous membrane. After receiving three treatments, he became discouraged and upset and did not report for further treatment. Last week he appeared in Dr. Menage's office and I saw him later in another physician's office. Clinically, it is a typical case of blastomycosis. At the end of the week we will have a report on the sections made today.

DISCUSSION

Dr. Faust: This can well be blastomycosis, but it is suggestive of rhinosporidium, which has a predilection for the tissues of the nose. I have had only one case, in Singapore. Rhinosporidium can be differentiated from blastomycosis only by section. I would certainly be interested in knowing what the laboratory study reveals.

Dr. Hopkins: Rhinosporidium is not seen in this country; I have never seen a case. Dr. Faust's suggestion is very good and it will be interesting to have him make sections and report on them at our next meeting. I agree with Dr. Van Studdiford; clinically, it is a clear case of blastomycosis.

Dr. Faust: I have the Malay's slide for comparison.

Dr. R. A. Oriol: It has all the earmarks of a typical case of blastomycosis. I have never seen a case of rhinosporidium, and if this should prove to be one, the observations of Dr. Faust will certainly be of interest to us.

Dr. T. A. Maxwell: The general appearance of the condition is that of blastomycosis. I think it is an excellent idea to study the case further, and since Dr. Faust has suggested rhinosporidium, we will look forward to the report on his examination at our next meeting.

A Case for Diagnosis. Presented by Dr. M. T. Van Studdiford.

E. H., white, a farmer, aged 58, at the time of his first entry to the hospital in January had crusty lestions over his chest which looked so much like rupial syphilis that I suggested to the intern that it was syphilis, and that went down on the record; later a pemphigoid eruption developed over the chest, shoulders and arms. The patient was anxious to go home, so after making several Wassermann tests, all of which were negative, he was discharged with a diagnosis of erythema multiforme bullosa. He returned just today, so we have not done any further work on him.

DISCUSSION

Dr. Faust: I would be interested in learning whether these lesions were primarily vesicles.

Dr. Hopkins: This man has one of three diseases which are almost impossible to differentiate: erythema multiforme bullosa, herpetiformis dermatitis or pemphigus. This is a problem with which we are often confronted, when diagnosis is not possible until after long observation of the patient, and when long observation often ends in a change in the diagnosis. No matter where these cases are seen, it is the same thing; there is always a difference of opinion as to which of these diseases it might be. My first selection as a diagnosis is herpetiformis dermatitis; erythema multiforme bullosa, second, and pemphigus, third. There is pronounced scarring, pigmentation and a history of a series of remissions and exacerbations. The lesions seem to appear more or less in groups, and that, I think, is a characteristic of either of the first two diseases more than of pemphigus. Besides, the lesions have been present for over a year now, and the patient is still in very good physical condition, which is more in favor of the first two diagnoses than of pemphigus. The distribution of the eruption, which avoids the hands and forearms and the mucous membranes, is much more

like that of herpetiformis dermatitis than of either of the other two conditions. One should not be too sure of the diagnosis. It has been said by men qualified to diagnose that pemphigus is diagnosed finally and positively by a fatal termination. The other two diseases are not fatal, but chronic.

DR. R. A. ORIOL: My first impression was that we were dealing with a syphilitic condition. Herpetiformis dermatitis must be considered, but I am in favor of pemphigus. The forming of these apparently superficial blisters which break so easily and reform in the same place, or very close to it, is suggestive of pemphigus foliaceus. Pemphigus has a tendency to recur, each succeeding attack being worse than the preceding. There are also cases of chronic pemphigus which do not end fatally; the condition comes and goes, and the patient does not feel any worse for it. In this case there are no lesions of the mouth, but the vesicles forming, breaking and reforming lead me to believe that this man has pemphigus foliaceus.

DR. T. A. MAXWELL: The three conditions mentioned are the only ones to consider, or discuss. I do not believe that this is pemphigus and would not like to make that diagnosis. In erythema multiforme there are lesions in the mouth; this man has no bullae in the mouth. So at this time my choice of the three conditions, as a diagnosis, is herpetiformis dermatitis.

MANHATTAN DERMATOLOGICAL SOCIETY

M. B. PAROUNAGIAN, M.D., *Secretary*

October 14, 1930

JEROME KINGSBURY, M.D., *Chairman*

MYCOSIS FUNGOIDES. Presented by DR. FRED WISE.

C. F., a woman, aged 42, from the Post-Graduate Clinic, had had a generalized eruption of one year's duration which consisted of markedly pruritic, discrete and confluent plaques over the entire skin. Scratch marks and papules were also present. The lesions on the hands were circinate. There was marked exudation and crusting associated with considerable infiltration. The lesions were all sharply demarcated from the normal skin. Histologically, the section presented only an exudative inflammatory reaction.

The skin of the trunk presented a large number of elevated, indurated, dusky red plaques with a smooth surface, located chiefly on the flexor surfaces of the forearms and on the chest and back. On the face, the upper and lower extremities and the various separate areas of the abdomen, buttocks and thighs, were plaques of exudative and infiltrated eczema, which could not be distinguished from seborrheic eczema. A second biopsy report was to be rendered at the next meeting.

The eruption appeared to be one of mycosis fungoides in which the initial lesions, appearing a year earlier, were indistinguishable from those of an ordinary seborrheic eczema.

Urinalysis showed nothing abnormal. The blood count showed 4,550,000 erythrocytes, 6,400 leukocytes, 80 per cent polymorphonuclear neutrophils, 4 per cent transitionals, 11 per cent small lymphocytes and 5 per cent large lymphocytes. There were no eosinophils. Food tests gave negative results.

There had been no improvement under roentgen or local treatment.

DISCUSSION

DR. HOWARD FOX: I saw this patient five months ago at which time she presented an eruption which, to my mind, did not remotely suggest mycosis

fungoides. It appeared to be a generalized seborrheic eczema. I think that the diagnosis of mycosis fungoides is quite possible at present on account of the thickened, elevated, reddish plaques.

DERMATITIS HERPETIFORMIS. Presented by DR. M. B. PAROUNAGIAN.

H. B., aged 26, had first been admitted to the Bellevue Hospital Clinic, on Jan. 28, 1926, and at that time presented lesions on the prepuce, accompanied with phimosis. He had been exposed about the first of the mouth, and the lesions were of a few days' duration. Dark-field examination on February 4, was positive, and treatment had been instituted on the same day with neoarsphenamine and injections of mercury. The records showed that from February 4 to May 19 he had had eight injections of neoarsphenamine and fifteen of mercuric salicylate. He had had two Wassermann examinations, February 1 and 4, which were negative, and on July 15, the Wassermann reaction again was reported negative. As he was free from lesions, he had remained away until Oct. 8, 1930.

The condition for which he was presented consisted of a generalized itching eruption of nine months' duration. The lesions were more or less grouped; they were vesicopapular and some were crusted; a number of urticarial wheals were also present. The older lesions had left marked pigmented remains. The itching was quite severe. The lesions were more marked on the back and the extremities, while the anterior portion of the chest and abdomen were slightly affected. The Wassermann reaction on October 30 was negative.

POIKILODERMA ATROPHICANS VASCULARE. Presented by DR. LUDWIG OULMANN.

J. G., an Italian, aged 40, had been operated on for a double hernia while in camp twelve years previously. At that time he had noticed on his abdomen, some red spots which had become larger and scaly and had spread continuously, at first over the abdomen upward and downward from the right to the left side, over the chest down to the thighs below the knee on the extensor side and over the calves.

Five or six years prior to presentation, the condition had started also in the axillae, extending down the arms into the region of the elbow. One year later, alopecia areata developed with bald areas scattered over the scalp.

On the forehead there were four round dark-brown, slightly scaly and infiltrated areas varying in size from that of a five cent piece to that of a fifty cent piece. The skin of the trunk was extensively affected, only the neck and upper part of the back remaining free. There was a free area the size of a palm over the sternum. The right mamilla was covered with a brown adherent crust; the left was flat, very red and retracted.

The affected skin had the appearance of a roentgen ray dermatitis with pigmentation arranged in rows over the claviculae, the diaphragm and the upper part of both arms, where the hairy growth of the axilla ended. Between the islets of capillaries were lentil-sized atrophic areas, and on the arms there was a wrinkled appearance. The lower part of the trunk and thighs showed areas of telangiectasia, pigmentation, erythema, wrinkling and dryness. The patient claimed that since the condition had spread over the trunk, he had suffered on hot days from lack of sweating on the affected areas, accompanied by headaches; in the winter, he felt chilly and noticed a burning sensation of the skin.

The patient had been presented the year before with the same diagnosis, but the case had not been reported. Since then the condition had been progressing on the forearms. For his subjective symptoms he had received an ointment consisting of a solution of aluminum acetate and tannic acid which had proved very efficacious.

Biopsy showed moderate keratinization and fragmented epithelial cells with obscure outlines. The basal cells lacked the sharp staining characteristics. The papillae were missing, and in many areas the epidermis had been lifted from the cutis. The subepithelial connective tissue formed a sharply defined layer in which

the nuclei had become clumped and formed dark chromatin masses separated from each other by a hyaline matrix. The outline of the cells was indistinct. In the lower portion of the layer was a deposit of brownish-black pigment in granular form between the cells. There was atrophy of the glandular structures. The elastic fibers were broken up in places, missing in others and clumped in still other places.

DISCUSSION

DR. LOUIS B. MOUNT: I am glad to see this case for the second time. It coincides with the description of the disease, as I know it.

DR. HOWARD FOX: We have all seen numerous cases presented as possible ones of poikiloderma vasculare. It is rather a relief to see such a classic example of this disease in which there can be no doubt as to the diagnosis.

PRURIGO MITIS. Presented by DR. FRED WISE.

D. D., a boy, aged 9, had presented himself about three months previously with a generalized eruption involving the upper and lower extremities and the upper part of the chest and back. He was seen at the Post-Graduate Hospital Clinic. At that time, the eruption consisted of small erythematous papules, most of them scratched and covered with red blood crusts. Numerous papular lesions were present surrounded by erythematous areas. The upper part of the body was covered with many white, small scars—the sites of old lesions.

At the time of presentation, the boy had numerous lesions on the extremities and back which were secondarily infected.

The mother stated that at times the child's lips had become markedly swollen, and his body presented an urticarial type of lesion. Subjective symptoms were itching and insomnia.

The potassium iodide test was negative.

Therapeutically, the child had received calcium gluconate, plasmochin, iron, quinine and strychnine mixture, and local treatment was salves, all of which produced only temporary relief.

DISCUSSION

DR. ANDREW GILMOUR: I believe that this is prurigo mitis, and that the pustules are secondary.

DR. MAX SCHEER: We see many cases of prurigo mitis and even severe cases in which a great deal of scratching by unclean fingers takes place, yet it seems to me that pustulation of the lesions is quite rare. I do not recall seeing a case with pronounced pustulation such as this patient shows. Some of the pyodermic lesions were flattened, and one was umbilicated. This may be an unusual pustular variety of the disease.

DR. ISADORE ROSEN: I suggest the diagnosis of chronic papular urticaria because of the short duration and absence of typical lesions of the skin, which we always find associated with prurigo, namely, a dry, infiltrated, coarse skin with small papular lesions. These are noticeably absent in this child, those present being large scratched ones such as one sees in chronic urticaria.

DR. HOWARD FOX: I think that prurigo mitis is the most probable diagnosis in this case. The eruption is chronic and consists of extremely itchy papules on the face and extensor aspect of the extremities. I do not think the presence of secondary infection is of particular significance. It can occur in any pruritic disease.

DR. M. B. PAROUNAGIAN: I agree with the diagnosis as presented. In the first place, the parents were born in Russia, and as to the duration, the mother told me it had been present since the patient was 1 year old. The location of the lesions on the face and forehead and the swollen glands would lead me to make a diagnosis of prurigo mitis.

A Case for Diagnosis (Iododerma?). Presented by Dr. Joseph J. Eller.

H. H., a white man, aged 31, a private patient, gave the following history: He had enjoyed splendid health all his life, and several periodic health examinations had given entirely negative results. He stated that one year previously he had developed several various sized, brownish spots over the body and legs. These lesions were slightly scaly and had remained unchanged. He consulted a physician who gave him a mixture containing arsenic and potassium iodide. The Wassermann reaction at that time was negative. Soon after consulting his physician, many small, bright red nodules began to develop over the trunk and extremities, and these lesions had continued to appear.

On September 3, when first seen by the presenter, the patient had many pea to dollar and palm size yellowish brown spots and patches over the lower part of the trunk and extremities. These lesions were slightly scaly. There were many pea to dime, quarter and dollar size nodules and tumors and all were similar in character. The smaller ones were bright red, raised, smooth and flat topped, and covered with a thin grayish scale. The larger lesions were of the same type and color, but the central half was covered with a grayish, laminated, oyster shell-like crust. These lesions were seen over the chest, and especially on the back, but were quite numerous over the face, scalp, arms and legs. There was an irregular ulceration, the size of a half-palm, on the anterior surface of the left tibia and a similar lesion on the left buttock.

The tonic and petrolagar were discontinued, but since that time many pea-sized lesions had continued to appear while the larger lesions were receding. About two weeks prior to presentation, the patient had passed a quantity of bright red blood at urination. There was no pain, frequency or other urinary complaint. Blood was seen on urination only on that one occasion. About ten days prior to presentation about twenty dime and quarter size lesions developed, many of which were covered with a dark brownish crust, but otherwise they were similar to the previous lesions. No new lesions had developed since that time, and all the old ones were slowly decreasing in size. The ulcer on the buttock had healed, but the one on the leg was still covered with dark red granulations.

The urine was negative for iodine. Repeated Wassermann, Kahn and Kline tests were all negative, and likewise those tests had been negative following a provocative injection of arsphenamine.

DISCUSSION

Dr. Isadore Rosen: I think this is a unique case—unique in its extensive distribution with the patient in such good physical condition. The disseminated nodular, crescentric and rupioid eruption, without pustulation, leads me to suggest a diagnosis of syphilis. An alternative diagnosis would be one of the rarer forms of psoriasis which sometimes gives a clinical picture coinciding with the appearance of some of these lesions.

Dr. Max Scheer: I think that a diagnosis of psoriasis can be excluded on account of the presence of ulcerations. Against a diagnosis of syphilis is the fact that some of the ulcers healed rapidly without therapy and left hardly any scars. I have seen ulcers of mycosis fungoides heal in this way.

The diagnosis of iododerma must be seriously considered. I have seen severe iododermas develop from quite small doses of iodides such as this patient had been taking; in fact small doses seem more likely to cause lesions on the skin than large doses; at times, further eruptions cease when the dose is increased. But the presence of ulcerations and the rapid resolution of some of the lesions suggest to me the possibility of an unusual (rupial) type of mycosis fungoides.

Dr. M. B. Parounagian: I would diagnose the condition rupial syphilis. The serology being negative, I think, if anything, we would have to put this in a tertiary class, and it would be nothing unusual to get a negative Wassermann reaction. The absence of iodine in the urine, I think, speaks against a diagnosis of iododerma.

DR. JOSEPH J. ELLER: Have any of the members seen an iododerma in which new lesions appeared, with the discontinuance of the drug?

DR. E. C. FOX: This is a tremendously interesting case, and some points in the history have not been thoroughly stressed. The patient first noticed some brownish spots, one year and a half ago, over the legs. These yellowish brown, slightly scaly, lesions have remained without change and are still present tonight. There is no infiltration of these lesions. One year after their appearance (six months ago) the patient consulted his physician, who prescribed a tonic containing potassium iodide. Soon thereafter these dull red papules and large nodules with laminated scales began to develop. He has been taking bromo-quinine over a period of years for colds, but not in the past few months, and has used iodized salt for the last three years. Both of these drugs have been discontinued. There has been definite improvement of the larger lesions, but the small red macules and papules have continued to appear.

DR. FRED WISE: I strongly favor the diagnosis of iododerma. Against a diagnosis of syphilis are the negative history, negative Wassermann reaction, the healthy children, the absence of miscarriages on the part of the wife and the absence of adenopathy. The fact that he took iodides and has inflammatory, tuberose lesions on the face would justify a diagnosis of iododerma tuberosa. The only thing rare about this case is the severity of the eruption.

DR. HOWARD FOX: Of the diagnoses mentioned, syphilis and iododerma seem to me to be most worthy of consideration. Bromides, however, could produce a similar picture. As Dr. Wise has said, the evidence speaks strongly against syphilis though more information could perhaps be obtained by further examination. A dark-field examination for spirochetes should be made after scraping one of the papules. Furthermore, a histologic examination might clear up the diagnosis. My opinion is that this is an unusually extensive iododerma, though the involution of the lesions has been very slow, in view of the treatment by salt solution. This ought to show the presence of iodine in the urine. I would suggest that the starch test be done with fluid from the lesions in addition to the urine. There is little I think of on which to base a diagnosis of psoriasis, some of the lesions being undoubtedly moist. There is no history of a previous attack of psoriasis, and at present the nails alone have a slight suggestion of this disease.

EPITHELIOMA (ERYTHEMATOID). Presented by DR. ANDREW GILMOUR.

C. K., a man, aged 53, married, born in the United States, gave a history that two and one-half years previously he had first noticed a small red spot just to the right of the midline of the center of the back. This had gradually increased in size and had never given any subjective symptoms.

Physical examination showed the lesion to be about 1 inch in size, red, denuded of skin, only slightly moist at times. The induration of the border was scarcely to be detected.

As long as the patient could remember, a lentil-sized, slightly reddish-brown mole had been present below the left lid. It was of interest because on it were two white dilated follicles resembling milia.

DISCUSSION

DR. GEORGE C. ANDREWS: I am not convinced that this is an epithelioma. The usual characteristics are lacking, and therefore the diagnosis will have to be settled by microscopic examination. The lesion is reddish brown and rather soft; the infiltration is not firm and it has no rolled border.

DR. LUDWIG OULMANN: I regard this as an epithelioma of the basal cell type.

DR. MAX SCHEER: I would call this a flat rather than a superficial epithelioma. Biopsy may possibly show that the growth extends deeply into the skin.

Dr. Satenstein, I believe, has a slide of a case of this kind, showing extension of the growth downward to the fat.

Dr. Andrew's objection to the diagnosis of epithelioma, because the lesion lacks a raised pearly border, does not hold, as epitheliomas of the flat or pagetoid or erythematoid (Graham Little) type lack this feature.

Dr. Joseph J. Eller: I agree that this is a flat type of superficial epithelioma.

Dr. Fred Wise: I agree with the diagnosis of epithelioma of the superficial type. This type of epithelioma shows no palpable infiltration or pearly edge. It is the absence of those points that leads to a diagnosis of this particular type of epithelioma, which Graham-Little called "erythematoid epithelioma."

Pyoderma of the Foot. Presented by Dr. Fred Wise.

J. R., a man, aged 40, presented four punched-out echthyma-like ulcers, together with several small scars, on the dorsum of the right foot. The patient had been referred to the presenter by an insurance company and the case was a compensation case.

The foot had been injured about two months previous to the presentation, and had been encased in a plaster cast for two weeks. On removal of the cast, the echthymatous lesions had first appeared.

DISCUSSION

Dr. Fred Wise: The tests for tuberculin were all strongly positive.

Dr. Ludwig Oulmann: If you look at those ulcers, you find a red infiltrated ring around each one. To my opinion, these are ulceration due to pressure in a tuberculous skin. On the leg there are a number of scars, the remains of a papulonecrotic tuberculid.

Dr. Joseph J. Eller: I should like to eliminate a diagnosis of dermatitis artefacta in this case. The patient has been injured quite frequently. Such patients like to stay away from work, and find all sorts of means for irritating their lesions. The lesions do not look typical of anything.

Dr. Louis B. Mount: In papulonecrotic tuberculid, there is dry necrosis in the center. This is not so in the case under discussion. Why could this not be the ordinary type of small callus ulcer? There is a callus ring present. Why should that not take a long time to heal on the dorsum of the foot, just as ulcers do on the lower part of the leg and on the sole?

Dr. Jerome Kingsbury: In my opinion, papulonecrotic tuberculid should not be considered. The case presents rather an unusual picture, and the history and appearance of the lesions are somewhat contradictory. I do not, however, believe that the man is a malingerer. More as a clinical classification than as a diagnosis, I suggest "compensation dermatitis."

A Case for Diagnosis (Psoriasis?). Presented by Dr. J. Frank Fraser.

C. E., a man, aged 23, had first been seen a year previous to presentation, at which time he had on the glans penis a discrete, papular eruption which resembled lichen planus. The condition had cleared up under a few exposures to the x-rays and three drop doses of a solution of potassium arsenite, three times daily. The patient returned later with a scaly eruption on the corona, which looked more like psoriasis than lichen planus.

DISCUSSION

Dr. Fred Wise: Dr. Fraser said when he originaly saw the patient, the lesions looked like lichen planus. I could not make out any lesions at the present time that looked like lichen planus. I suggest the possibility of ringworm, and that microscopic examination be made for ringworm fungi.

DR. MAX SCHEER: I would suggest the possibility of psoriasis. The lesions are sharply defined, pale pink and slightly scaly. Psoriasis may be present on the penis alone.

DERMATITIS VENENATA. Presented by DR. JOHN FRANK FRASER.

V. R., a girl, aged 19, single, presented a swollen, edematous condition of the lids and cheeks and an erythematovesicular eruption of the anterior and upper surface of the chest. There had been several attacks with remissions during the last three months. The present outbreak had begun three days before presentation.

NOTE.—The patient had been seen again on November 13 when she reported a similar attack following the application of cold cream and lip stick.

DISCUSSION

DR. FRED WISE: I suppose the diagnosis of dermatitis venenata is correct. In European clinics they are now calling these cases eczema, and then try to find out the cause. The eruption looks like it might be a case of light sensitization, although the backs of the hands are free. If Dr. Fraser thinks light sensitization might have something to do with it, I would expose a small area of the body to ultraviolet light to see if the patient is hypersensitive to light, and would also examine the urine for hematoporphyrin. I would protect the skin against light with a lotion or some brown salve.

DR. ISADORE ROSEN: I agree with the diagnosis of dermatitis venenata and suggest hospitalization in order to remove the patient from everyday environment. I have seen similar cases in which the eruption cleared up entirely when the patient was removed to the hospital, only to recur when he returned home.

CHICAGO DERMATOLOGICAL SOCIETY

Regular Meeting, Oct. 15, 1930

MICHAEL H. EBERT, M.D., *Vice-President, Presiding*

HYPERPIGMENTATION. Presented by DR. OLIVER S. ORMSBY.

This patient was presented before this Society at the January, 1930, meeting, at which time there was marked hyperpigmentation of the forehead, temples, sides of the face, neck and forearms. The question raised then was whether or not the pigmentation was induced by the materials with which the patient came in contact in his work or by other unknown causes. His work required contact with two powders, one containing iron and nickel, the other chromium, sodium silicate and talc.

The condition was entirely cleared up with a series of injections of sodium thiosulphate together with a keratolytic ointment. The result was as good as it was unexpected.

DISCUSSION

DR. UDO J. WILE: The case that we presented at the February meeting was an exact counterpart of this; although the same metal was not involved, Dr. Ormsby's patient working with nickel and our's with steel, it appears that the common offending substance in both cases was apparently chromic acid. This patient states that the chromic acid has been replaced by tartaric acid and that the pigmentation is disappearing. All this suggests that the pigment is not a fixed metallic one similar to that caused by silver or lead, but that it is due to some associated substance in the industry in which the patient is engaged. So far as I know, except for the ingenious method Dr. Stillians has introduced for argyria, the metallic pigments are fixed and do not disappear.

DR. OLIVER S. ORMSBY: This patient was shown because of his recovery. I am not sure that the treatment with sodium thiosulphate produced the result, but he made no improvement until that treatment was instituted. He was removed at once from the place where he was working so as not to come in contact with the powder that he thought induced the trouble. The powder is a black substance composed of nickel and iron. He also comes in contact with a powder containing chromic acid, sodium silicate and talc. The important question concerns the relation, if any, between these powders and the cutaneous changes. I felt that in the early stages the disease was not an industrial pigmentation, but now I am rather inclined to that opinion. What part sodium thiosulphate played in eradicating the pigment cannot be stated. I have tried it in argyria without result. I have seen good results occur when it was used in cases of arsenical pigmentations and keratoses, but I do not think that it has a specific effect in other pigmentary disorders.

LYMPHOBLASTOMA. Presented by DR. OLIVER S. ORMSBY.

A man, aged 44, presented a disorder of fourteen months' duration. When seen eight months before presentation, the patient complained of intense itching of general distribution. This was particularly noted on the shoulders and neck and was less marked below the knees. There was also a general erythema. The cervical, epitrochlear and inguinal glands were moderately enlarged. Roentgen examination of the chest and glands showed no evidence of lymphogranulomatosis. Examination of the blood revealed 12,200 leukocytes; the differential count showed: small lymphocytes, 44 per cent; large lymphocytes, 8 per cent; polymorphonuclears, 46 per cent, and eosinophils, 2 per cent. Two months before presentation, the observations of the blood showed 11,900 leukocytes; the differential count revealed 62 per cent lymphocytes, of which 8.5 per cent were described as immature cells, 35.5 per cent as polymorphonuclears, 1 per cent as mononuclears and 1 per cent as transitionals.

In August the patient was examined at the Mayo Clinic, and Dr. Goeckerman and Dr. Montgomery reported that the blood smears suggested lymphatic leukemia and that the histology of the glands suggested lymphogranulomatosis. The infectious type of leukemia was also suggested by Dr. Wellbrock. Under deep roentgentherapy and injections of a vaccine prepared at the Mayo Clinic, the patient had made some improvement.

DISCUSSION

DR. UDO J. WILE: This, I think, is an extraordinarily interesting example of an unusual dermatitis associated, as seems likely, with dyscrasia of the blood and lymphadenitis. It seems fair to assume that the lesions of erythematosis, which are not only erythematous but definitely infiltrative, are not of the same nature as the infiltrations in the glands.

I wonder if it is not appropriate at this time to emphasize that we commonly see true infiltrations of lymphoid infiltrates in skin that may be said to be metastatic, in the sense that the infiltrations are of lymphoblastomatous type without any change in the blood. Conversely, while on the watch for these cases, we frequently attach too much importance to a transient lymphocytosis, perhaps an increase of from 15 to 30 per cent of lymphocytes. At present we have a patient under observation with an exquisite type of myeloid leukemia. She has a large spleen, and there are lesions in the skin, but at present the blood count is normal so far as leukemia is concerned. Undoubtedly she has had myeloid changes in the blood stream at some time, for otherwise there is no way to account for the lesions in the skin. More and more I think that we must accept the cutaneous lymphoblastomas as a greatly confused and fluid picture, with enormous mutations. A few years ago, no one would have suggested that this was a case of lymphogenous leukemia, and yet in spite of the patient's good health and apparent well being, he seems to be harboring a disease which is dangerous and which may terminate seriously.

DR. S. W. BECKER: We had the privilege of observing the patient about ten months before presentation; he then exhibited generalized pruritus and erythema. He had no glandular enlargement, and the skin was not thickened. Over a period of six weeks, the leukocyte count varied from 12,500 to 15,300. The small lymphocytes varied from 64 to 79 per cent, and the polymorphonuclears, from 13 to 23 per cent. On examination our hematologists could not find any abnormality in the lymphocytes.

DR. OLIVER S. ORMSBY: I think that the point brought out by Dr. Becker is interesting in view of the fact that we have had the same experience several times. About five years ago, I showed two patients before the Society, one of whom had a generalized erythroderma in association with leukemia, and the other had pityriasis rubra of Hebra, with a normal blood picture. The two patients were shown to demonstrate that we could get similar cutaneous changes from different causes. Two, or possibly three, years later we saw this patient in Dr. Wile's clinic, and he then showed definite changes in the blood. I have seen several patients with a potential leukemia in association with different cutaneous diseases, and I think that we cannot always be sure that the changes in the blood are responsible for the cutaneous disease. I have seen cases of parapsoriasis with a leukemic blood picture in which the general health remained undisturbed for years.

A few months ago I saw a patient who had a striking clinical group of symptoms with a marked lymphocytosis, suggesting acute lymphatic leukemia. She had brownish-red nodules on the nose, face, neck and upper part of the chest. The tonsils were markedly enlarged, and the posterior cervical glands were enlarged. The blood picture showed 40,000 leukocytes. A differential count at that time showed: polymorphonuclears, 8 per cent; large mononuclears, 17 per cent; small mononuclears, 64 per cent, and degenerative forms, 11 per cent. The Wassermann reaction was negative. Later in the course of the disease, the small lymphocytes increased to 85 per cent. Under treatment with arsphenamine, the cutaneous lesions cleared up, and the tonsils returned to normal with no change in the observations of the blood. After several months, gangrene occurred on the foot. Surgical intervention was resorted to, but a fatal termination resulted. Dr. Herrick said that he would class the case as marked lymphocytosis, but that he was not sure that it was leukemia.

Dr. Wile has done a lot for us in classifying these cases properly, and I am glad to have him see all the cases possible to aid in their elucidation.

EPIDERMOLYSIS BULLOSA. Presented by DR. H. J. MITCHELL and DR. RUBEN NOMLAND.

Four of six children in this family affected with this disease were seen; in the two older children the condition had disappeared; two of the eight children had never been affected. The father had had the condition from childhood until after puberty. All of his sisters (five) had the condition, and all had children every one of whom had been affected. This history was obtained from the mother and seemed fairly reliable.

While there were variations in severity, the disease was essentially the same in all. There was a formation of more or less painful bullae, chiefly on the feet and thighs, but also on the palms, and to a less extent on the arms and legs. The disorder was much better in winter than in summer, and there was a tendency to spontaneous recovery shortly after puberty. The child aged 2 had the fewest lesions, which were located on the soles and palms. A girl, aged 9, had the greatest involvement, with noninflammatory bullae on the soles, a few on the legs and thighs, some on the hands and arms, and many macules in these regions which were the sites of recent lesions.

DISCUSSION

DR. H. E. MICHELSON: I am skeptical about the diagnosis of epidermolysis bullosa in these three children. I think that the condition is bullous impetigo.

The children are infested with pediculi, and the hair is loaded with nits. The family history is of no value, because the parents are so ignorant about the questions asked that I can readily understand that they might be misinterpreting any cutaneous lesions that might have been present. There are several points against epidermolysis bullosa. Since the lesions occurred so early dystrophic changes would be expected, and there are none in the nails or in the shape of the fingers. The nutrition of the children is very good. In marked epidermolysis bullosa there is usually a general dystrophic change. Then, too, it would be unusual to see three members of the same family in the same generation with the disease. I would accept the diagnosis of epidermolysis bullosa in these children only if they were hospitalized, had their heads clipped and did not respond to treatment for impetigo.

DR. J. H. MITCHELL: I saw these children in the clinic for a short time about four months ago. At that time the lesions on the hands and feet were exactly the same as they are now. The mother, contrary to the impression Dr. Michelson received, appeared to me to be rather intelligent. I talked with her at considerable length while the students were looking at the children. The mentality of the children is very low; one child is in an institution for the mentally defective. At that time the bullous lesions about the palms and soles were, at least to my mind, characteristic of epidermolysis bullosa. The mother told me that almost any little trauma on the hands or feet of the children would result in a blister. It seems to me that if impetigo had been going on for as many months as this, a different picture would have been produced. I do not insist too strongly on the diagnosis without further study, and I agree that we should have the children in the hospital. I think that they should be cleaned thoroughly, whether the condition of the skin would be benefited or not. A significant point is the absence of impetiginous crusting at any point on any of the patients.

SUPERFICIAL BACTERIAL INFECTION OF THE HAND, SIMULATING EPIDERMOMYCOSIS. Presented by DR. CLEVELAND WHITE.

A school girl, aged 13, had had an eruption on the dorsum of the left hand for eight months. The patient stated that the original area had been on the dorsal surface of the middle phalanx of the index finger. When first seen, the involvement extended over the dorsal surfaces of the index, middle and ring fingers and back onto the hand. There were deep-seated vessels at the margins of the erythematous, scaly, crusted areas. The patient had never had any previous disorders of the skin, but had been under the supervision of a tuberculosis unit for the past nine years, although no tuberculosis had ever been found. In fact, she felt well and attended school regularly. The clinical diagnosis of ringworm was made, and efforts were made to confirm it by laboratory methods (results of the examination of the feet and nails, however, were absolutely negative for ringworm). During ten weeks, sixteen unsuccessful attempts were made to find fungi microscopically. On cultivation, the roof of the vesicles, etc., grew *Staphylococcus albus* in almost every planting at different times. Finally, the infection was considered a bacterial one closely allied to those in the cases reported by Dr. J. H. Mitchell (Amycotic Dermatoses Simulating Ringworm and Erosio Interdigitalis Blastomycetica, ARCH. DERMAT & SYPH. **19**:659 [April] 1929). Dr. Fred D. Weidman (Laboratory Aspects of Epidermophytosis, ARCH. DERMAT. & SYPH. **15**:415 [April] 1927) stated the belief that all three classes of microorganisms, namely, bacteria, *Blastomycetes* and *Hyphomycetes,* can cause so-called epidermophytosis. Therapeutically, all the usual fungicidal remedies were of no avail, and we finally caused the eruption to disappear by treatment with an especially prepared staphylococcus vaccine.

DISCUSSION

DR. J. H. MITCHELL: The history of this case fitted in with the subject I attempted to discuss at the Washington meeting of the American Dermatological Association. I am convinced that there is an infectious dermatitis of the hands,

particularly the backs and interdigital spaces, which simulates fungous infection. The pus infections are quite different in many ways from the fungous infection. The patients do much better on simple antiparasitic treatment than on anything in the way of fungicidal applications. I was pleased to see this case demonstrated, as it confirms my observations recorded in the ARCHIVES.

DR. CLEVELAND WHITE: As stated before, repeated examinations of the affected area revealed no fungi, and no fungous foci were present elsewhere to give rise to a toxic eruption. Dr. Mitchell's observations in regard to bacteria causing this type of infection seem to be well substantiated by this case.

A CASE FOR DIAGNOSIS (NEURODERMATITIS). Presented by DR. MICHAEL H. EBERT.

A white woman, aged 29, presented an eruption on the legs and thighs which she said had been present "since birth," and which itched intensely. Within the past week, a few lesions had appeared on the forearms; within the past few months, the legs had become swollen, especially the left.

There was a band about 8 inches (50 cm.) wide around each thigh, most marked anteriorly, which was made up of many discrete, match head-sized, dull red, firm papules, many of which were excoriated. In addition, there were smooth round scars of the same size and pigmented macules. Similar bands occurred below the knees, but here the lesions formed firm, irregular patches about 2 by 5 cm., which resembled lichen planus hypertrophicus. In addition, there were scars, pigmented macules and many excoriations, some hypertrophy of the anterior surface of the tibia and a few excoriated papules on the extensor surfaces of the forearms. No lesions were present in the mucous membrane. The Wassermann reaction of the blood was negative.

DISCUSSION

DR. H. R. FOERSTER: I do not know just how to classify this case, since it has certain rather bizarre features that do not fit in with a definite entity. The lesions are chiefly on the extensor surfaces, they appear primarily to be punctate excoriations, and they exhibit secondary lichenification that is especially circumscribed in the areas of longest involvement. I would call it a pruritic dermatitis of the neurodermite type.

DR. J. H. MITCHELL: I saw this patient once in the clinic last summer, and in talking with her at length I got a history that she spends the greater part of some nights digging the lesions out. They are situated at convenient areas on the legs and forearms. This has been going on for many years. She is distinctly neuropathic in her make-up, and whatever the underlying cause of the disorder may be, I believe that this case would fit in with what we understand as neurotic excoriations. Whether there is a preceding pruritus or formication I do not know, but I am inclined to think that most of the lesions are self-inflicted and that the case rests on a psychopathic sexual basis. I have under observation a young woman who does the same sort of thing for sexual gratification. She was referred to a Freudian expert, who got some good stories but no therapeutic results. She has what she calls "dates with her boy friend." At about the time she is to go out, she imagines she sees things on her face and then calls up her boy friend, cancels the date and spends the evening digging at her face. I suspected that the digging is a very satisfactory substitute for a "date."

DR. E. A. OLIVER: After examining the lesions on the lower legs, I thought that we might have to consider atypical Duhring's disease. The patches are isolated, with areas of normal skin between. They are made up of distinct papules, and there is a great deal of pruritus attending them. I think that even this neuropathic person should be given the benefit of the doubt.

DR. H. R. FOERSTER: I considered the possibility of neurotic excoriations, as suggested by Dr. Mitchell, but believed that a strong point against that diagnosis was the absolute symmetry of the lesions. They are as widespread and as intense

on one side as on the other and, until recently, have been confined to the lower extremities. The more recent lesions, located on the forearms, show the same feature.

DR. OLIVER S. ORMSBY: This case would probably be placed in the group reported by some French colleagues as neurodermatitis with prurigo nodularis as part of the picture. Pautrier recently reported a group of cases, and practically declared that there is no such thing as prurigo nodularis, and that all of the cases are part of the neurodermatitis group. I never saw a case that suggested this connection until today. The lesions in prurigo nodularis itch intensely and remain indefinitely unless removed surgically. This patient has a number of lesions that suggest prurigo nodularis, and she also has patches of lichenification. It appears to me that the patient has an underlying disorder which produces the cutaneous lesions, and that the latter differ from those commonly seen in neurotic excoriations. In those cases, the patients injure themselves seriously. We now have a patient with excavations in the face deep enough to hold a pigeon's egg. Commonly the patients have only a few lesions, and they do not complain of itching, whereas this patient has numerous lesions and also much itching. I am not sure how to place the case, but I think that it might fit in Pautrier's group of neurodermatitis.

DR. RUBEN NOMLAND: I have watched this patient since she was seen at the dispensary and agree with Dr. Oliver. I have been hoping that definite evidence of dermatitis herpetiformis would develop, but it has not.

DR. LESTER WIEDER: The patient is apparently frank about the fact that she has itching and that she has scrached the lesions. If the condition is dermatitis factitia, it must have been produced without conscious motive.

DR. S. W. BECKER: We have been studying patients with pruritic dermatoses for two years, among them neurotic excoriations and neurodermatitis, which I believe are combined in this patient. This study is to be the subject for discussion at the next Scientific Session of the Division of Dermatology of the University of Chicago, on Nov. 7, 1930. The French recognize the underlying nervous stigma, but the Germans, including Jadassohn, state that they have seen neurodermatitis in stolid, nonnervous persons. We have carried the study a step further, and have found the same underlying mechanism in both types of patients, namely, a deficiency of energy.

DR. MICHAEL H. EBERT: I discussed this case with Dr. Waugh, and he said that it was a little different from anything that he had ever seen. I agree with him, and that is why the patient was presented. If I were asked to give two diagnoses, I would combine neurotic excoriations with neurodermite, but there are objections to both. If we can put any credence on the patient's statement, the condition has been present since birth or early childhood. The localization on the thighs and legs has always been the same, with a few lesions on the arms at present. Casual examination revealed hypertrophy of the legs, particularly the left. On this account and the general habitus of the patient, I had a Wassermann test made, which gave negative results. I think that an examination of the family should be made, with the thought that there may be congenital syphilis with changes in the central nervous system. The patient has tachycardia, and she should be examined for the possibility of a toxic condition of the thyroid gland.

A CASE FOR DIAGNOSIS (ERYTHEMA INDURATUM?). Presented by DR. RUBEN NOMLAND.

A colored woman, aged 38, had been under treatment for two years for a condition diagnosed as erythema induratum. She had received many injections of neoarsphenamine and, more recently, gold sodium thiosulphate. Several Wassermann tests had given negative results. Within the past two years a swelling of the roof of the mouth had developed, which was hard, firm and painful. In addition, she had pigmentation and a few scars above both ankles.

DISCUSSION

DR. UDO J. WILE: I would suggest a diagnosis of midline exostosis of the palate.

DR. LESTER WIEDER: That diagnosis occurred to me, but the growth is painful and apparently was of rapid onset. I think that we should consider the possibility of a tuberculous focus, because of the pain and the tuberculous lesions elsewhere.

DR. H. R. FOERSTER: I am of the same opinion as Dr. Wile. It is probable that the lesion has been present for a long time and that it has come to the patient's notice only recently, possibly because of an incidental trauma. The location and conformation of the nodule are characteristic of this type of bony overgrowth.

LUPUS ERYTHEMATOSUS DISSEMINATUS ACUTUS. Presented by DR. E. P. ZEISLER and DR. MAX S. WIEN.

A white woman, aged 23, was admitted to the hospital with a reddened eruption over the face, neck, hands and feet of two weeks' duration. In addition, she complained of progressive weakness and loss of weight during the past four months, associated with cough and frequent night sweats. Her past history was unimportant, and there was no history of tuberculosis in the family.

Examination showed a diffuse, maculopapular, erythematous dermatitis, involving the exposed areas of the upper part of the thorax, of the "bathing suit" type. The face, excepting the circumoral region, was similarly involved. Fine dry scaling was present without follicular dilatation, and disseminated, bluish papules were present on both hands. There was some stomatitis. She had coughed frequently since admission, and bloody expectoration had been noted repeatedly. The temperature had varied between 100 and 103.2 F.

Urinalysis gave negative results, and roentgenograms of the chest were negative.

There had been slight improvement following several intravenous injections of sodium thiosulphate.

LUPUS ERYTHEMATOSUS. Presented by DR. E. A. OLIVER and DR. MAX S. WIEN.

J. Z., a white man, aged 33, during the past six months had received a total of fifteen injections of gold sodium thiosulphate for a lesion on the right side of the lower lip.

He entered the hospital on Aug. 18, 1930, and stated that for the past two weeks he had had an eruption that was first noted following the last injection of gold sodium thiosulphate. At that time he presented the picture of a mild, generalized, exfoliative dermatitis. Dispersed throughout the dermatitis could be seen discrete, oval, mildly scaling papules that followed the distribution of pityriasis rosea. Within the next ten days considerable involution of the generalized, exfoliative dermatitis occurred, with marked accentuation of the pityriasis roseiform eruption. During the subsequent course, the papules became infiltrated, many of them presented a lichenoid appearance, many were oval and followed the lines of cleavage of the skin, and some were bluish, especially over the upper part of the chest, where there was a tendency also to confluence. Scattered lesions showed central clearing with a peripheral fine line of scaling. These lesions were of annular type and varied from the size of a dime to that of a five cent piece.

The results of a general examination of the patient were essentially negative. The Wassermann and Kahn reactions of the blood had been repeatedly negative. The blood sugar was 125, and the blood chloride, 640. The urine was normal.

The blood count showed: erythrocytes, 3,540,000, and leukocytes, 15,200. The differential count revealed: neutrophils, 68 per cent; lymphocytes, 16 per cent; transitionals, 4 per cent, and eosinophils, 12 per cent.

The patient had been receiving sodium thiosulphate during his stay in the hospital.

Biopsy from a scaling, infiltrated papule on the lower part of the abdomen revealed a thin, nonnucleated scale. The epidermis showed no atrophy or flattening. The granular layer was continuous but thin. The basal layer was continuous and contained many brown granules. The rete cells showed moderate intercellular and intracellular edema that varied from slight to complete ballooning and caused degeneration of the cell. The corium was edematous and showed slight infiltration with lymphocytes and fibroblasts, with a few chromatophores in the upper part.

Sudan III stain showed no fat in the epidermis.

DISCUSSION

DR. H. E. MICHELSON: I think that the diagnosis in the first case is acute lupus erythematosus of the exanthematous type, and I believe that the prognosis is grave and the termination not far distant. The second case is extraordinary. From the histology I would not consider the picture to be that of a specific reaction due to a heavy metal. It might, however, be that of a toxic reaction. I believe that the section rules out the possibility of the lesions on the body being lesions of lupus erythematosus. I am not familiar with the histology of a dermatitis definitely due to a gold compound in the same sense that there may be a phenolphthalein eruption due to phenolphthalein.

DR. E. A. OLIVER: In looking over the discussion in the *British Journal of Dermatology* of a number of cases of lupus erythematosus in which the patients were treated with a gold compound, I came across the discussion of Dr. Wigley. He said that one can determine the presence of gold by means of a simple procedure, that of taking a small amount of tissue, treating it with hydrochloric acid and then heating the tissue until it is dry. Then the residue is burned, and if it burns with a violet-blue color, it is a positive sign that gold is present. I think this worth trying. I believe that the first case is definitely one of lupus erythematosus. Within the last several years we have had about four cases of disseminated lupus erythematosus under observation. All of the cases have terminated rapidly and fatally. In all of the cases the cause of death was bronchopneumonia.

DR. J. H. MITCHELL: I had the opportunity to see the second patient in the clinic last summer, when the condition seemed more active, and I demonstrated it at that time as a reaction to a gold compound. Since then I have seen a similar but less extensive reaction in a woman. Her case reminded me of one in a patient I saw about three years ago, which was particularly rapid in its development. That patient was first seen by Dr. Mook in St. Louis, who made the diagnosis of psoriasis because the condition was so mild. She came to Chicago within two weeks, and at that time had lesions on the lips and stomatitis which left no question but that the condition was the exanthematous type of lupus erythematosus. A few weeks later the patient died. Some of you may recall the case of a patient I presented a few years ago. He was very ill at that time and died two weeks later.

DR. UDO J. WILE: In the second case I should like to distinguish between acute exanthematous lupus erythematosus and disseminated lupus which is not acute. It seems to me, without any relation to the treatment, that the lesions on the body of this patient closely resembled those of erythematous lupus. He had a lesion of lupus erythematosus on the lip and now has disseminated lesions on the body.

DR. H. E. MICHELSON: When Professor Snapper was here last summer he discussed the changes in the kidney in acute disseminated lupus erythematosus and reported several interesting observations, which will be published in the minutes of the Minnesota State Medical Association.

DR. RUBEN NOMLAND: The first patient was first seen about a month before presentation. She then had what was apparently an acute dermatitis, which

we at first thought to be a rouge dermatitis. About a week later she returned, acutely ill, with chills and fever, and the lesions on the face grew more edematous daily. There were beginning toxic alopecia of the scalp and a few papular lesions on the chest and fingers. We then thought that the condition was acute disseminated lupus erythematosus, and the patient was advised to enter the Cook County Hospital.

The second patient was under observation at the dispensary for many months. He was given gold sodium thiosulphate for the lupus erythematosus, which was limited to the lower lip. A week after one of the treatments, he came in with a generalized eruption, few systemic symptoms and a scaling eruption. The most marked observation on that occasion was that he had extreme generalized lymphadenopathy, the epitrochlear glands being as large as a nut. He was given sodium thiosulphate, but there was no improvement. The condition became worse, and Dr. Mitchell then saw him. I believe that the consensus was that the eruption was a disseminated lupus erythematosus and not a reaction to the gold. Incidentally, I believe that the biopsy bears out this fact. There is too much inflammatory reaction for it to be a reaction of the skin to a heavy metal.

DR. E. P. ZEISLER: Concerning the woman with the acute exanthematous eruption, we have been struck by the fulminating course of the disease. These patients seldom live more than a few weeks or months. She probably has an involvement of the lungs, and this coincides with Ehrmon's view that the acute disseminated types of lupus erythematosus indicate a tuberculous septicemia.

The lesions presented by the second patient have a striking resemblance to the lichen planus-like eruptions that occasionally follow the administration of arsphenamine. I cannot quite reconcile the picture with any case of lupus erythematosus disseminatus that I have ever seen. I think that it is a lichen planus-like eruption following the use of a gold compound.

DR. MAX S. WIEN: The lesions have changed considerably during the patient's stay in the hospital. When he was first seen we thought of the toxic manifestations following treatment with a gold compound. Lichenoid eruptions are not frequently reported in the literature, although O. Kiess (*Dermat. Wchnschr.* **86**:4 [Jan. 28] 1928) reported a case and showed pictures of a patient treated with aurophos, whose condition had a striking resemblance to the clinical picture in the case shown. Barber reported the case of a patient with a lichenoid eruption after the use of solganol (*Brit. J. Dermat.* **42**:404 [Aug.-Sept.] 1930). In the second case presented the biopsy was taken from a scaling lesion. We will try to take one from the other lesions and follow out Dr. Oliver's suggestion.

(The results of the examination for gold in the skin, as suggested by Dr. Oliver, were negative in the specimen tested.)

A CASE FOR DIAGNOSIS (GENERALIZED DERMATITIS). Presented by DR. MICHAEL H. EBERT and DR. RUBEN NOMLAND.

A Jewish boy, aged 15, was first seen in Dr. Ebert's clinic in April, 1930. At that time the disorder was said to have begun six weeks previously as an itching dermatitis of the face, which spread to the shoulders and then to the body. The eruption consisted of large papules, many flat and angular. In some places they had fused to form large thickened patches. A biopsy was taken. The patient was not seen for several months, but returned in August with a generalized dermatitis involving the entire body, except the palms and soles. The entire integument was purplish-red, very thick and infiltrated.

A general examination revealed nothing but moderate enlargement of all the lymph glands, which was thought to be due to the inflammatory condition of the skin. He was observed by Dr. Mitchell for a time in the Presbyterian Hospital, but nothing of importance was found.

Several blood counts had been made; that made on August 13 showed: hemoglobin, 90 per cent; red cells, 5,180,000; white cells, 12,700; differential count: neutrophils, 50; eosinophils, 20; lymphocytes, 24, and monocytes, 6. On one occasion an unchecked leukocyte count of 28,000 was found.

The biopsy from the early papular lesion showed marked parakeratosis, acanthosis, marked papillary and subpapillary edema and moderate diffuse but increased perivascular infiltration about the dilated vessels of the inner cutis.

There was severe itching which had been controlled somewhat by fractional doses of the roentgen rays.

DISCUSSION

DR. F. E. SENEAR: This interesting picture has much in accord with that seen in ordinary lymphoblastomas, and I think that it will finally prove to belong there. The unusual papillomatous development apparent about the ankles, knees and some of the other joints was more marked than anything I have seen previously in cases of this type. The patient had an underlying ichthyosis, which may account for the unusual hypertrophy in the skin.

DR. J. H. MITCHELL: I was privileged to see this patient in the clinic last summer, and I diagnosed the condition lymphoblastoma. He had not been seen for some time prior to that, but had been in Dr. Ebert's clinic in the spring, when the appearance was that of lichen planus. When I saw him, he had acquired a dusky hue with intense pruritus, and I was convinced that the condition was lymphoblastoma of the pityriasis rubra type. He was placed in the hospital, and I asked an intern to study the blood, but he was not impressed with the blood picture. I remember that Keim made the point that an increase in the leukocyte count will not occur unless the lymphoblasts find conditions favorable for growth in the blood stream. A blood count that was made at my office gave between 20,000 and 25,000 cells. It was repeated at the dispensary, where it was around 12,000, and it was again repeated in the hospital. As far as I can determine, the condition is lymphoblastoma of the pityriasis rubra type.

DR. RUBEN NOMLAND: When Dr. Ormsby first saw this patient, he said that if he had to give the condition a name he would call it lichen planus. A biopsy quite definitely ruled this out. When Dr. Ormsby saw him on the second occasion, several weeks after the biopsy, he felt certain that the boy had an eruption which belonged to the lymphoblastoma group.

PSORIASIS, ARSENICAL DYSKERATOSES, MULTIPLE EPITHELIOMAS. Presented by DR. A. W. STILLIANS.

An American merchant, aged 58, had had psoriasis since the age of 14 years. About thirty years before presentation he took arsenic (solution of potassium arsenite) for two years, without benefit. He had noticed the patches, which were not scaly, for many years. Three years before presentation he was treated for fine epitheliomas, receiving four units of roentgen rays for each lesion. Two of the lesions on the back had recurred. At the edge of a scar on the right arm, the site of a former epithelioma, was a patch of dyskeratosis, the lower third of which had regressed, leaving brown pigment.

On examination, the patient was found to be apparently in good health, with many patches of psoriasis and, among them on the trunk, several flat, slightly infiltrated, brownish-red plaques finely polycyclic in outline, with a rough surface and at the border in many places tiny flat papules forming a limiting line. Just within the hair line to the right of the median line of the forehead was a nearly square depression surrounded by a narrow, waxy infiltrate, with dilated venules. On the upper part of the back was a patch of dyskeratosis below a node 1.5 cm. in diameter and 0.5 cm. high. In the lumbar region was a flat elevation about 3 by 2.5 cm. in diameter and 0.3 cm. high, with ulceration of the surface. Both of these adjacent scars resulted from previous roentgen therapy.

DISCUSSION

DR. F. E. SENEAR: I was interested in this case, because, as you will all recall, Dr. Graham Little, some years ago, gave these lesions the name erythematoid benign epithelioma. We had been seeing these cases for some time. I recall that in his article Little described the relative frequency of this condition in

psoriasis. This impressed me, because I had recently seen two patients with psoriasis in whom the benign type of epitheliomatosis developed. Since that time I have seen two more cases. I think that the interesting question to be considered is whether the use of arsenic precipitates the epitheliomatosis or whether there is something in the psoriasis that tends toward the development of these lesions. I have seen two cases in which the ingestion of arsenic could be ruled out entirely. I think that in this case the arsenic has no relation to the disorder.

DR. H. E. MICHELSON: Sir Normal Walker gave an interesting lecture in London last year on "Fifty Years in Dermatology," in which he entertainingly discussed the development of epitheliomas in previously treated lesions, especially those of lupus vulgaris.

DR. A. W. STILLIANS: I was interested chiefly in the question of arsenic. It seems to me that the possibility of arsenic being present in the body is just as likely to have something to do with this condition as does psoriasis. The factor that made me enthusiastic about the question of treatment with arsenic is that we have one or possibly two patients with arsenical keratoses on the hands who show this form of keratosis elsewhere.

A CASE FOR DIAGNOSIS (SYPHILIS?). Presented by DR. RUBEN NOMLAND.

A well nourished colored man, aged 29, stated that about six years before presentation he had an illness which disabled him for a year or more. He had had pain and swelling of the legs, and "sores" had developed that left scars, which were still present. His recovery followed about eighteen "shots," most of which were given in the arm. About that time, whether before or after the beginning of his illness he did not know, he had a chancre. He had since remained well until two months before presentation, when new sores appeared on the legs, one or two of which had healed. He had occasionally taken bromo-seltzer for headaches.

On the front and back of both legs were circular, atrophic scars, so numerous that they were almost contiguous. The normal skin here was hyperpigmented. In addition there were several recent granulating ulcers. There were fewer scars on the thighs, some on the left side of the chest and some on the arms and forearms. The scars varied in diameter from about 1 to more than 2.5 cm.

The Wassermann reaction was strongly positive, but there had been little, if any, therapeutic response to two injections of neoarsphenamine.

DISCUSSION

DR. LESTER WIEDER: I thought that these lesions could be explained on the basis of ecthyma. There are no definite gummas at this time. The patient said that he had marked itching and admitted scratching freely.

DR. H. R. FOERSTER: It is hazardous to attempt a diagnosis on evidences of past disease, such as scarring, but I believe that syphilis should be ruled out because of the large number of scars, their irregular contours and the haphazard distribution and apparent superficial character of the previous inflammatory process. I would favor the diagnosis of ecthyma in a syphilitic patient.

DR. RUBEN NOMLAND: I do not believe that the assumption of an ecthyma would explain the scars or the atrophic lesions which are so numerous. On the basis of the fact that he has a positive Wassermann reaction and that the lesions cleared up under antisyphilitic therapy, the provisional diagnosis of syphilis was entertained. I should like to have some one discuss the point of whether or not this may possibly be dermatitis nodularis necrotica.

PYODERMA (STREPTOCOCCUS). Presented by DR. J. H. MITCHELL.

A man, aged 27, had had pyoderma for fourteen years. When seen in the summer of 1930 at Rush Medical College, he had a large undermined area on one leg, which discharged clear serous fluid in large quantities. There were

numerous smaller lesions on the back. He was placed in the hospital, and a pure culture of hemolytic streptococcus was obtained from the throat and from the ulcers. Cultures of the blood were negative. He was treated with potassium permanganate baths, the roentgen rays and, principally, culture filtrates locally. A great deal of investigative work revealed nothing but *Streptococcus hemolyticus* or a pathogen. Biopsy revealed an inflammatory infiltrate made up chiefly of plasma cells.

PYODERMA (STREPTOCOCCUS). Presented by DR. J. H. MITCHELL.

A man, aged 27, a rabbinic student, was referred by Dr. Cardon on July 18, 1930, with ulcers on the outer side of the right foot and ankle that had been present for one month. There was no history of trauma or of insect bites. The lesions began as pustulopapules which rapidly broke down and developed into undermined ulcers. New lesions developed from time to time. All cultures were negative, except for *Streptococcus hemolyticus.* No fungus was found either microscopically or by culture. The ulcers were bathed in a clear, yellowish, profuse serum in which streptococci, phagocytic and in chains, were to be found. The Wassermann reaction was negative. The general health had been excellent. The patient was treated with potassium permanganate baths, quartz light and the roentgen rays. The lesions were entirely healed, but photographs of the original lesions together with photomicrographs were demonstrated.

DISCUSSION

DR. CLEVELAND WHITE: The etiologic bacteria found by Dr. Mitchell in these cases mark a new chapter in this clinical entity, which often proves so baffling to all known therapeutic measures. I am willing to accept the observations. The results of the combined therapy are most striking.

DR. E. P. ZEISLER: If we looked at the lesions on the face and back alone we might classify the case as acne cachecticorum. The lesions on the legs are different, and I am willing to accept the opinion that the streptococcus is the etiologic factor.

DR. F. E. SENEAR: I was interested in both of these cases. I think that the first fits in closely with the cases we saw at the meeting of the Dermatological Conference of the Mississippi Valley. We saw one case in Minneapolis and a group at Rochester, and while we had seen several cases of that type before, our attention was called to them so strikingly at that time that I think we as dermatologists had not previously recognized them. I think it well worth while that Dr. Mitchell has shown the same type of pathologic change in these lesions. We all see the lesions about the ankles in patients with poor circulation, and are usually inclined to regard them casually. After having been stimulated by Dr. Mitchell's demonstration of a specific etiology for these cases, I think that we will all regard them differently in the future.

DR. UDO J. WILE: I think that now that Dr. Mitchell has cleared up these cases, I have seen some that I did not recognize. Dr. Duemling just reminded me of a case I saw, that of a patient, a morphine addict, with ulceration extending from the ankle half way up the thigh. This case reminded me of the progress seen in cases in which the ameba is the etiologic factor, but in that case the only observation was *Streptococcus hemolyticus.* It never occurred to me before, however, that the streptococci were the etiologic organisms.

DR. J. H. MITCHELL: It is rather interesting to me to demonstrate two other cases, as it has been more than five years since my first case of this type was shown. That patient gave a history of having been bitten by an insect on the left arm. A furuncle type of lesion developed which spread rapidly. I saw him about two months later and was immediately struck by the undermined border. I had in mind the possibility of the presence of ameba, and I studied cells under the warm stage so often and for such long periods that I imagined ameboid movement. They were merely large cells and were not amebae. Dr. Mook saw the patient about that time and agreed that the progress was not rapid enough to be

amebiosis. The patient was exhibited at the annual meeting of this Society in 1925, but Mrs. Snyder informs me that the report of that meeting was lost and was never published. The case was therefore presumably not mentioned in the recent report from the Mayo Clinic on pyodermas. At that meeting I overheard one of my colleagues, who did not know that I was near, say, "Mitchell does not know tuberculosis when he sees it." Various other complimentary remarks were made at that time about my lack of diagnostic perception. I went ahead, however, and treated the boy, got him a free bed in the hospital and did all possible laboratory work. The bacteriology was thoroughly studied by competent bacteriologists. Vaccines were made and given. On two occasions acute lymphangitis and large glands in the left axilla developed. He was given surgical solution of chlorinated soda, quartz light and intensive roentgentherapy, and the lesions entirely cleared up. The patient was shown at a later meeting and the report does appear in the minutes.

I believe that we are dealing with a disease entity. There are similar cases in the literature, particularly in volume 246 of the *Archiv für Dermatologie und Syphilis.*

The patient presented had a severe infection of the tonsils. After they were removed, he immediately improved.

In regard to the agglutinins, Miss Rhodes told me that the organism agglutinated so rapidly that there could be no value in the determination. Some of you may be familiar with the work of Burbank, who used the absence of complement fixation as the index of lack of resistance to a given strain of streptococci. Therefore, instead of finding the organism that agglutinated, he picked out the one that did not agglutinate and to which there was no complement fixation. There was no complement fixation in this case, and some might argue that the streptococcus was not the etiologic factor, but the presence of streptococci in the tonsils and of streptococci, both phagocytic and in chains, in the peculiar serum contradicts that. Dr. Nomland may remember that I was at once struck by the peculiar bluish appearance of the undermined lesions and predicted the microscopic observations.

A Case for Diagnosis (Degeneration of Skin. Scleroderma?). Presented by Dr. Max S. Wien.

C. W., a Negro, under observation in the department of medicine because of thyrotoxicosis, had an eruption on the neck and trunk which he stated had been present as long as he could remember. An older sister said that her first knowledge of the eruption was when the patient was 10 years old. There had been no subjective sensation. The blood picture was essentially normal. The Wassermann reaction of the blood was negative, and urinalysis gave negative results.

The patient presented discrete, disseminated, shiny papules, which varied in size from that of a split pea to that of a bean, with only a slight tendency to confluence. Many of the lesions were angular. The eruption was most marked over the midsternal and interscapular regions, with extension to the axillae, the sides of the neck and the auricular regions.

Biopsy revealed the following changes: There was a thin scale, which in several places was nucleated. The epidermis was thickened, most of the changes being in the rete pegs. The stratum granulosum was thickened. The suprapapillary rete showed little change, except that in several places it was very thin. The rete pegs showed marked acanthosis with lengthening, broadening and occasional fusion of the pegs. The rete cells showed a moderate degre of intracellular and intercellular edema, but no vesicle formation. Many mitotic figures were present, and the epidermis was infiltrated by a few spindle and round cells that had invaded through the broken basal layer. There was massive cellular infiltration, largely limited to the upper part of the corium and filling the papillae to the epidermis. It consisted of about equal numbers of lymphocytes and macrophages scattered throughout, but most numerous at the tips of the papillae.

In the lower part of the corium, the blood vessels were dilated and surrounded by narrow mantles of similar infiltration. Larger masses of similar infiltration extended down along the sweat ducts and surrounded the sweat glands. The hypoderm was normal.

DISCUSSION

DR. RUBEN NOMLAND: The biopsy does not show atrophy, but an elastic tissue stain should be made. I studied a similar case last spring in a Negress, who had areas of depigmentation, the size of a dime, and very slight atrophy, which showed a microscopic picture entirely compatible with the guttate type of scleroderma.

DR. F. E. SENEAR: I saw this patient with Dr. Wien. An intern had made a diagnosis of pityriasis versicolor, but I was unable to make any definite diagnosis for the condition. I thought that the condition would be found to belong to some degenerative condition in the skin. I would amplify that to accept Dr. Nomland's remarks.

DR. MAX S. WIEN: I believe that a definite diagnosis can be made by further histologic examination and staining of the elastic tissue, which will be done. (Special staining and histologic examination revealed no disease in the elastic tissue.)

DR. H. E. MICHELSON: I should like to ask Dr. Nomland if there was a complete loss of pigment in morphea in the colored woman whose sections he studied.

DETROIT DERMATOLOGICAL SOCIETY

H. J. PARKHURST, M.D., *Reporter*

Regular Meeting, Oct. 21, 1930

C. K. VALADE, M.D., *Presiding*

LUPUS ERYTHEMATOSUS. Presented by DR. A. E. SCHILLER.

A. F., a woman, who had previously been presented before the Society with lesions on the scalp, ears and neck and around the mouth, was again presented with an involvement of the upper and lower lips. There were small, nonpigmented scars at the sites of former lesions on the neck, ears and scalp. From June, 1929, to May, 1930, 2,900 mg. of gold sodium thiosulphate had been administered, but the condition of the lips had not improved.

DERMATOPHYTOSIS. Presented by DR. A. E. SCHILLER.

L. C., aged 38, and L. C., aged 13, mother and daughter, presented extensive scaling, erythema and the formation of vesicles between the toes and on the dorsal and plantar surfaces of the feet; both had lesions of the pompholyx type on the hands. Therapeutic measures had failed in both cases.

DISCUSSION

DR. GEORGE VAN RHEE: After the acute symptoms have subsided, the application of from 20 to 30 per cent salicylic acid in alcohol may be effective.

ACNE VULGARIS OF KELOIDAL TYPE. Presented by DR. A. E. SCHILLER.

A. F., a single woman, aged 22, had had acne as long as she could remember, and had received a considerable amount of treatment. Many of the lesions had been pustular, and these had largely disappeared when bacteriophage was employed.

On both shoulders there were large areas of telangiectasia and atrophy, following previous roentgen treatment. There were many large and small keloidal scars, especially over the back of the trunk.

DISCUSSION

DR. H. S. BARTHOLOMEW: Such stubborn cases often present some serious internal disease, such as pulmonary tuberculosis.

DR. A. E. SCHILLER: In this case, after the subcutaneous use of bacteriophage, the pustules disappeared, but they are slowly returning after a lapse of six months.

DR. C. K. VALADE: I have had some success with bacteriophage in two similar cases.

MULTIPLE BENIGN TUMOR-LIKE NEW GROWTHS OF THE SKIN (SCHWENINGER AND BUZZI). Presented by DR. GEORGE VAN RHEE.

M. B., an Italian housewife, aged 40, presented bladder-like lesions on the left side of the jaw, the neck, the shoulders and the upper part of the arms, varying in size from that of a bean to that of a medium coin; the largest lesion was on the jaw. They were bluish white, and some showed delicate superficial telangiectasia. The so-called button-hole phenomenon could be demonstrated by pressing on most of the lesions. The condition was said to be of two years' duration, and the lesions were increasing. Histologically, a cyst was found, separating the stratum corneum from the underlying epidermis, and a loss of dermal elastic tissue was reported, together with slight perivascular infiltration. The Wassermann reaction was negative.

DISCUSSION

DR. A. E. SCHILLER: This appears to be atrophy of the tissue, not exactly of the Schweninger-Buzzi type.

DR. H. J. PARKHURST: I agree with Dr. Schiller. The lesions seem too flat, and I could feel no button-hole in them.

DR. H. L. KEIM: I agree with the diagnosis of Schweninger and Buzzi's disease.

BLASTOMYCOSIS. Presented by DR. ROLLIN H. STEVENS.

E. W., a Canadian housewife, aged 64, in good general health, stated that a pruritic lesion, at first flat and later elevated, had appeared on the left leg thirty-two years previously. It had persisted, and had been called lichen planus. Arsenic had been administered for two years, with some apparent benefit. However, two years before presentation the lesion had begun to enlarge and become verrucous, and more recently the patient had been able to express purulent material from these areas. There was no pain and only slight itching. *Blastomyces* had been found in the pus. A biopsy report of carcinoma had been received six weeks previously. Roentgenograms showed a little periosteal proliferation of the underlying tibial surface.

DISCUSSION

DR. C. K. HASLEY: Multiple groups of *Blastomyces* were found in the pus.

DR. H. L. KEIM: Were any found in the sections?

DR. C. K. HASLEY: No.

A CASE FOR DIAGNOSIS. Presented by DR. WILLIAM G. SAUNDERS.

S. G., a Negro, aged 24, had first noticed a dermatitis six months previously, after eighteen intravenous (arsphenamine?) injections. On the extensor surfaces of the arms, the left shoulder and the neck, there were about six slightly pruritic

patches, ranging in size from that of a small coin to that of a large one, sharply outlined, lichenified and scaling. Histologic slides were presented. Cultures had annual meeting of the Society, in June, 1930.

DISCUSSION

DR. C. A. DOTY: The lesions on the arms appear eczematous. The etiology may be gastro-intestinal.

DR. R. C. JAMIESON: Although no mycelia or spores have been found, it may still be a case of tinea.

DR. H. J. PARKHURST: Dr. James and I also thought of a dermatophytid, and found bogginess between the third, fourth and fifth toes of both feet.

DR. C. W. BEHN: We should not classify these lesions as fungous without having found the organisms.

DR. L. W. SHAFFER: I agree with Dr. Behn. A large percentage of Negroes have tinea of the feet. These lesions may or may not be dermatophytids.

GRANULOMA FUNGOIDES. Presented by DR. R. C. JAMIESON.

Mrs. E. M. S., an American-born Negress, aged 26, had first noticed the appearance of cutaneous lesions at the age of 6 years. The left hip had been involved at first, and subsequently the trunk, the arms and the legs. The first outbreak had lasted for several months, disappearing spontaneously, only to reappear the following spring. This had been a yearly occurrence ever since then, according to the patient. The latest outbreak, as presented, was of six or eight months' duration. The lesions were multiform, consisting of rounded, circinate patches, papules and slightly elevated plaques, varying from 1 to 5 cm. in diameter and larger, and all were rather sharply outlined. They were irregularly scattered over the trunk, arms and legs, and itched intensely at times. The color of the lesions could not be determined accurately. The general physical examination, roentgenograms of the chest, Wassermann and other laboratory tests gave negative results. The leukocyte count of the blood was 10,500, with 5 per cent large mononuclear and 16 per cent small mononuclear lymphocytes. A dense, irregularly distributed infiltration of lymphocytes and plasma cells was found in the derma.

DISCUSSION

DR. H. L. KEIM: I have seen this patient for five or six weeks, and had felt that the lesions were suggestive of late annular and circinate syphilids, but they have not disappeared under antisyphilitic treatment. The condition is granuloma, and may become lymphoblastoma. Repeated biopsy examinations should be made.

DR. GEORGE VAN RHEE: The condition is probably the premycotic stage of granuloma fungoides.

DR. R. C. JAMIESON: Some of the lesions are oval, round and circinate, with a history of recurrences over years, and the patient remains in good health, with the histologic picture of a granuloma. I consider it a case of granuloma fungoides.

DR. L. W. SHAFFER: I agree with a diagnosis of granuloma fungoides, but the degree of pruritus seems surprisingly slight.

A CASE FOR DIAGNOSIS. Presented by DR. GEORGE VAN RHEE.

E. H., a housewife, aged 45, presented large infiltrated plaques on the elbows, knees and dorsa and soles of the feet. Those on the elbows and knees had first appeared a year previously, while the feet had been affected for twelve years. All of the patches were covered with dry, white scales, and there was some lichenification and considerable fissuring. No fungi were found in cultures, and

the Wassermann reaction was negative. The condition of the feet had improved following applications of a solution of potassium permanganate, 1:4,000, and half strength Whitfield's ointment. This patient had been presented before the last annual meeting of the Society, in June, 1930.

DISCUSSION

DR. H. J. PARKHURST: The clinical appearance of the toes suggests dermatophytosis, and the sequence of events in the history would indicate that the neurodermite on the elbows and knees may be a dermatophytid.

CLEVELAND DERMATOLOGICAL SOCIETY

H. J. PARKHURST, M.D., *Reporter*

Regular Meeting, Oct. 23, 1930

J. R. DRIVER, M.D., *Presiding*

CANCER EN CUIRASSE. Presented by DR. H. N. COLE and DR. J. R. DRIVER.

T. E., a Negress, aged 44, had first noticed an eruption about the right nipple ten years previously, which was soon followed by the appearance of small lumps in the skin of this area. For four years before presentation, the nodules had been spreading over the front of the chest, and for the last year they had been breaking and exuding a whitish material. The neck had been stiff during the last year, and for the last month the left arm had been swollen, without pain. Both breasts and the intervening area presented a shieldlike area of infiltration, with a few hard, discrete nodules over the surface. The central part showed some erosion and serous exudation. A collar of shotlike lymph nodes extended up the side of the neck; the left arm and hand were edematous, and there was dulness on percussion over the lower part of the right side of the wall of the chest posteriorly. The pathologic report was "medullary carcinoma."

EPITHELIOMA OF THE TONGUE. Presented by DR. H. N. COLE and DR. J. R. DRIVER.

A. D., a white man, aged 50, stated that he had first noticed a small papule on the left side of the tongue three years previously, following some dental work. Irritated by a tooth snag, a dental bridge and continual cigar smoking, the process had extended, without pain. The left half of the tongue was invaded by an indurated mass, with a vegetating projection the size of an almond. There were small, hard, discrete, painless lymph nodes below the ramus of the mandible. Leukoplakia was present, and the Wassermann reaction was strongly positive. The biopsy report had not been returned. The process was subsiding under radium therapy, needles having been employed.

DISCUSSION

DR. H. N. COLE: In certain malignant conditions inside the mouth, we are using small doses of radium over a long period of time, screening out the alpha and beta rays.

BASAL CELL EPITHELIOMA. Presented by DR. H. N. COLE and DR. J. R. DRIVER.

J. K., a man, aged 67, presented extensive destruction of the soft tissues and the bone of the right side of the face. The nose was involved, and a pearly border was visible. The process was of thirty years' duration, and it had been

treated in various ways by many physicians over a period of years. Two years before presentation, radium emanation seeds had been implanted in the affected area, and following this electrocoagulation had left a clean wound, but there were signs of recurrence six months later.

PSORIASIS AND ARTHRITIS. Presented by DR. H. N. COLE and DR. J. R. DRIVER.

H. C., a woman, aged 56, presented a generalized eruption of nummular lesions with silvery scales, arranged chiefly in gyrate groups. There was a deforming arthritis of the hands, of six years' duration. The psoriasis was said to have appeared first about three years before presentation.

ALOPECIA TOTALIS. Presented by DR. H. N. COLE and DR. J. R. DRIVER.

F. B., a girl, aged 12, had lost hair rapidly from May 1 to Sept. 15, 1930, when she had become totally bald. There were no eyebrows or eyelashes, and the finger-nails were pitted and irregular. The toe-nails seemed normal. The patient had been restless and irritable for several months. She was said to have had "intestinal influenza" in 1928, having been confined to bed for two months at that time.

DERMATOPHYTOSIS (?) Presented by DR. H. N. COLE and DR. J. R. DRIVER.

A. M., a woman, aged 52, had had a pruritic, papular eruption on the palms and soles for five weeks. The lesions were dull red, deep, infiltrated, keratotic and scaling, and deep bullae were also present on the soles. The cubital flexures were involved, with shining flat papules. Laboratory data had not yet been received.

DERMATOPHYTOSIS. Presented by DR. SIDNEY LITTMAN.

Mrs. R., aged 49, presented markedly hyperkeratotic and fissured patches on the soles, and a similar, thinner patch, on the right knee. The condition was of fifteen years' duration; it appeared during the colder seasons and faded in the summer.

DISCUSSION

DR. C. L. CUMMER: The first of the two patients with dermatophytosis showed pitting of the nails, suggesting psoriasis. Although I punctured the "bullae," I could not express fluid from them. The second patient presented features of psoriasis or dermatophytosis.

DR. E. W. NETHERTON: I consider both cases to be dermatophytosis. The lesions in the first case appear to be vesicular.

DR. H. J. PARKHURST: In both cases the interdigital condition was indicative of dermatophytosis.

EPITHELIOMA OF THE PENIS. Presented by DR. H. N. COLE and DR. J. R. DRIVER.

P. M., a man, aged 39, presented a hyperplastic and ulcerative condition of the glans penis, of eight months' duration, its appearance resembling that of a relief map. There were a few hard, discrete, painless, inguinal lymph nodes. Serologic and dark field observations had been negative.

DISCUSSION

DR. C. B. NORRIS: At first one might think of Vincent's balanitis, but the infiltration and sclerosis suggest a malignant process similar to kraurosis vulvae.

DR. ROBERT E. BARNEY: I felt that the condition was the morphea type of epithelioma; study of the histologic slides confirmed this impression. The condition seems to correspond to the kraurosis vulvae seen in females.

LICHEN PLANUS ATROPHICUS. Presented by DR. H. N. COLE and DR. J. R. DRIVER.

Mrs. L. G., aged 70, had first been observed in October, 1926, with a pruritic eruption on the chest, neck and back. After the administration of five quarter unit doses of roentgen rays, the eruption had disappeared, but four or five months before presentation, it had recurred on the chest and left shoulder. Three quarter unit doses of roentgen rays were then given, and considerable improvement followed. Over the upper part of the chest and the left shoulder there were several groups of as many as eight or ten discrete, rounded, split pea-sized lesions, with a parchment-like surface. Some of these lesions showed a suggestion of a central plug. The study of sections showed an intense cellular infiltration in the upper part of the corium.

DISCUSSION

DR. C. G. LAROCCO: The lesions on the chest show features of lichen planus atrophicus.

DR. E. W. NETHERTON: I agree with the diagnosis. This is a classic case.

DR. H. N. COLE: This condition must be differentiated from scleroderma.

A CASE FOR DIAGNOSIS (PITYRIASIS ROSEA?). Presented by DR. H. N. COLE and DR. J. R. DRIVER.

P. A., a man, aged 36, stated that eighteen days previously he had noticed generalized pruritus, followed in a few hours by the appearance of a lesion on the right cheek and during the next few days by a generalized eruption. The lesions were mostly erythematous macules, ranging in size from that of a pea to that of a large coin, with superficial scaling; intermingled with these were a number of somewhat infiltrated, erythematous papules the size of a pea. The results of serologic and biopsy examinations had not yet been reported.

DISCUSSION

DR. J. E. FISHER: In considering the possibilities in this case, I thought of a drug eruption, but there was no history of medication. It apparently is not seborrheic dermatitis, for the scalp is not involved. I think that it is a case of pityriasis rosea, with the herald patch on the face.

DR. J. R. DRIVER: A few days ago the lesions, when palpated, felt like wheals, and the eruption resembled that of erythema multiforme or disseminated lupus erythematosus. At that time I favored a diagnosis of erythema multiforme.

DR. H. J. PARKHURST: I consider this case one of pityriasis rosea. The location of the herald patch is most unusual. There is some resemblance to disseminated lupus erythematosus, but the patient's apparently excellent general health argues against that possibility.

LICHEN PLANUS. Presented by DR. SIDNEY LITTMAN.

A. T., a mechanic, aged 28, presented a generalized, pruritic eruption of violaceous, polygonal papules, of three months' duration. The oral mucosa was involved. Some of the lesions about the ankles were of the hypertrophic type. The condition was unusually resistant to various forms of treatment.

DISCUSSION

DR. J. R. DRIVER: I understand that mercury has not been administered. It may be beneficial.

LYMPHOBLASTOMA. Presented by DR. JOHN M. CAVANAUGH.

S. D., a man, aged 57, stated that three months previously he had first noticed "hivelike" areas on the lower part of the right leg. These lesions itched and extended, and afternoon swelling of the legs was noticed. A tumor then appeared on the left forearm. During the ten days immediately preceding presentation, the itching sensation had extended over the abdomen and arms. There had been dyspnea for three months. Small tumors were palpable in the skin of the back, the abdomen and the chest, the largest being beneath the right axilla. The superficial lymph nodes were not palpable.

DISCUSSION

DR. ROBERT E. BARNEY: This case presents several interesting features. There are many subcutaneous nodules and an orange-sized tumor resembling a lipoma in the axilla. There is diffuse, doughy infiltration in the inguinal regions, and I found discrete, firm nodules in the scrotum. There is a scaling eruption on the arms and the anterior part of the trunk and an acutely inflammatory process on the lower extremities. The spleen is enlarged, and the dyspnea suggests involvement of the mediastinal lymph nodes. I consider this case to be lymphoblastoma.

DR. H. N. COLE: Reports of blood counts and a biopsy examination would be of interest.

GRANULOMA ANNULARE. Presented by DR. CLAUDE B. NORRIS.

A. W., a boy, aged 9, had recently been under treatment for loss of weight, and had been kept in bed for four weeks. He complained of pains in the right foot, which showed lesions of two weeks' duration. On the dorsum of the foot there were many small, firm, waxy nodules, in oval formation.

DISCUSSION

DR. H. J. PARKHURST: The lesions are firm, waxy and arcuate. I consider this a case of granuloma annulare or erythema elevatum diutinum.

DR. R. E. BARNEY: Last year I had a case of erythema elevatum diutinum in a girl, and found the histologic features of granuloma annulare.

A CASE FOR DIAGNOSIS. Presented by DR. H. N. COLE and J. R. DRIVER.

J. M., a man, aged 34, had had a recurrent gonorrheal urethritis four months previously, but there were no evidences of it at the time of presentation. There was no history of a genital sore, headaches or sore throat. An occasional ex-lax tablet had been taken as a laxative. There was a papular eruption of the hands, the forearms, the lower part of the legs and the feet, of twenty-five days' duration. The papules on the palms and soles were discrete, rounded, deep, reddish brown and whitish, with cornification. On the medial and lateral surfaces of the feet, the lesions became almost confluent, and there was scaling. Vesicles, genital lesions and involvement of the mucous membrane were not observed. Recently the Wasserman reaction had been negative.

DISCUSSION

DR. EMERSON GILLESPIE: This does not appear to be a case of blenorrhagic keratoderma, for there are no ostraceous crusts or arthritis. The punctate keratoses suggest arsenical lesions, but there is no history of arsenical medication. The condition may be erythema multiforme, but the clinical appearance is more suggestive of a syphilid.

DR. H. G. MISKJIAN: On the wrists I found red, scaling patches indicative of parapsoriasis.

DR. H. F. DEWOLF: We had a similar case last winter—a keratotic palmar syphilid.

DR. H. J. PARKHURST: The keratoses do not seem as firm and sharp as arsenical keratoses. The lesions lack the infiltration of a syphilid. I consider the condition a toxic erythema, or perhaps blenorrhagic keratoderma.

DR. H. N. COLE: We are not convinced that the eruption is a syphilid. It may be an unusual type of erythema multiforme.

MINNESOTA DERMATOLOGICAL SOCIETY

D. D. TURNACLIFF, M.D., *Secretary*

Meeting of Oct. 23, 1930

E. C. GAGER, M.D., *President, in the Chair*

ACANTHOSIS NIGRICANS, JUVENILE TYPE. Presented by DR. H. E. MICHELSON.

A girl, aged 17, presented a verrucous eruption in both axillae, about the umbilicus and at the sides of the neck. There were no subjective symptoms and no signs of inflammation. The patient was a distinct "endocrine" type; she weighed 225 pounds (102 Kg.) and was 5 feet, 6 inches (167.6 cm.) in height. The basal metabolism was plus 10. Roentgenograms of the skull showed no abnormalities of the sella, and there was no history of ovarian dysfunction. A biopsy showed a papilliform arrangement of the epidermis with an increase of pigment in the basal layer. The cells in the cutis showed pigment. There were no signs of inflammation. (A biopsy specimen was shown).

DISCUSSION

DR. PAUL O'LEARY, Rochester: The presumptive diagnosis of acanthosis nigricans seems justified at this time, but a subsequent observation will be necessary to determine whether the case is of the benign or malignant type. The early manifestations presented by this patient call to mind three cases of acanthosis nigricans of the acquired type in which an exploratory laparotomy was done shortly after the onset of the disease. The surgeon was unable in either case to demonstrate evidence of visceral malignancy in spite of a detailed and thorough scrutiny of the abdominal viscera. In each case, however, the patient died of a carcinomatosis within a period of approximately three months following the operation. In this small group it appeared that surgical intervention had hastened the development of the carcinomatosis. I do not recommend an abdominal exploration in the patient presented by Dr. Michelson because at present it appears as though the benign type of acanthosis nigricans is in the process of developing.

DR. HAMILTON MONTGOMERY, Rochester: I believe that this is a definite case of acanthosis nigricans, and that the histopathologic picture establishes the diagnosis in the case. The sections show a relative and absolute hyperkeratosis with hyperkeratotic crypts, marked irregular acanthosis intermingled with areas of relative atrophy of the prickle cell layer, increased melanin pigmentation of the basal cell layer, and a lack of appreciable inflammatory change in the cutis. An analysis of the component parts of the pathologic picture often permits an early diagnosis to be made before the clinical picture is typical. Staining the sections with silver nitrate and counterstaining with hematoxylin will bring out the amount of melanin pigment present.

LUPUS ERYTHEMATOSUS OF THE HAIRY SCALP. Presented by DR. H. E. MICHELSON.

A woman, aged 54, stated that she had a spot that had appeared on her scalp about twenty-five years previously, and that gradually the hair was lost in this area. About eight years previously the area had begun to enlarge, and at the time of presentation, it was about 10 cm. in diameter and covered the crown of the head. The skin was thin, atrophic, and devoid of hair and showed many small horny plugs in the sebaceous openings. There were no other areas of the condition on the body.

CASE FOR DIAGNOSIS (MYCOSIS FUNGOIDES, PSORIASIS?). Presented by DR. H. E. MICHELSON.

Mrs. A. S., a Russian Jewess, aged 44, a housewife, presented an eruption of six months' duration. The first lesion had appeared over the left clavicle in May, 1930. In about two weeks this lesion was followed by a general outbreak of lesions, which were confined to the trunk, the neck, the upper part of the arms and the thighs.

The patient presented herself at the University Dermatology Outpatient Department in June, 1930, complaining of a severe pruritis. The lesions ranged in size from that of a bean to that of an olive; they were oval, dully erythematous, discrete patches, capped by a thin central scale. The long axis of the lesions appeared in the lines of cleavage of the skin. A diagnosis of pityriasis rosea was made, and the patient was given an antipruritic ointment. The patient returned from time to time exhibiting no improvement symptomatically or objectively.

In August, 1930, it was noticed that the lesions had become infiltrated and were about twice their former thickness; they had taken on a bluish-red color. The pruritis became intolerable. A possible case of premycotic mycosis fungoides was considered. The patient was given moderate doses of roentgen rays; the lesions partially involuted, but the pruritis remained. Urinalysis gave negative results. An examination of the blood showed: hemoglobin, 87 per cent and white cells, 5,500, with 47 per cent polymorphonuclears and 53 per cent lymphocytes. The Wassermann reaction of the blood was negative. A biopsy showed some parakeratosis, the presence of a few leukocytes in between the epidermal cells, some irregular acanthosis and a slight infiltrate about the vessels in the cutis. The microscopic picture suggested psoriasis. (A biopsy specimen was shown).

SYPHILIS: HYPERTROPHIC PAPULES BETWEEN THE TOES. Presented by DR. S. E. SWEITZER.

A laborer, white, aged 38, gave a history of a penile lesion in 1927, which was diagnosed as syphilis and treated, while still in the primary stage, for three months with intramuscular injections (apparently twenty-four of bismuth and twelve of mercury). No further treatment had been given.

Three months previous to presentation, the patient had noticed small blisters on the sole of the right foot. These blisters broke down and extended, particularly between the toes. A foul odor had been noticed one month previously, and also about one month previously the patient had noticed similar lesions on the anterior surface of the scrotum. These lesions also spread.

The patient presented ulcerating elevated lesions between and around the toes of the right foot. These lesions were moist, granulomatous and had a foul odor. The scrotal lesions were firm, coalescent, elevated, and not ulcerated. The right testis and the epididymis were large and hard. The Wassermann reaction of the blood was positive; the Kahn reaction 4 plus. Dark-field examination of the lesions on the foot was positive for *Spirocheta pallida*. A Wassermann test of the spinal fluid gave negative results. Pandy's test gave positive results; the Noguchi test gave negative results, and the colloidal gold curve was 555,432,000.

SCLERODERMA (CIRCUMSCRIBED). Presented by DR. H. E. MICHELSON.

Mrs. A. P., aged 73, came to the University Dermatological Clinic because of an eruption of two years' duration which was situated at the waistline. The lesion consisted of a sharply circumscribed band of about 2 inches (5 cm.) in diameter which extended from one iliac spine to the other. The skin was thickened; lardaceous in color, and covered with a fine dry crust. The borders were erythematous and slightly elevated. The patient complained of pain and itching, most marked at the periphery of the lesion. A biopsy specimen showed scleroderma.

DISCUSSION

DR. PAUL O'LEARY: I should like to correct an erroneous impression apropos of the surgical treatment for scleroderma. Cervicosympathetic ganglionectomy was recommended as a means of treatment for the type of scleroderma associated with Raynaud's syndrome. You have all seen patients with scleroderma with a history of vasospastic disease of the extremities, in addition to sclerodactylia. These phenomena are manifested in one of three ways: 1. The Raynaud syndrome precedes the onset of the sclerodactylia. 2. The Raynaud's disease and the sclerodactylia appear concurrently. 3. The features of Raynaud's disease, color, temperature and pain, developed after the appearance of the sclerodactylia.

Ganglionectomy is productive of the most satisfactory results in the first group, less so in the second, and least of all in the third type. Within the past three days I have seen two physicians with the localized linear type of scleroderma without sclerodactylia, who came to me with the idea of having a ganglionectomy performed, but this is the type of case in which ganglionectomy has not as yet produced encouraging results.

A CASE FOR DIAGNOSIS (LICHEN PLANUS?). Presented by DR. H. E. MICHELSON.

A man, aged 58, stated that red, itching spots about 2 cm. in diameter had appeared on his body, and had been present for the past three years. On examination there were noted about twenty small plaques on the arms and trunk, slightly elevated, covered with a fine scale and deep red. The mucous membranes were clear. The microscopic picture showed a slight increase of the granular layer of the epidermis and a closely packed infiltrate of a nonspecific type, sharply demarcated at its lower border, and situated in the papillary portion of the cutis. The microscopic picture was suggestive of lichen planus, but not pathognomonic. Therapy had been injections of mercuric salisylarsenate, with definite improvement. (A biopsy specimen was shown.)

LICHEN SCLEROSUS ET ATROPHICUS. Presented by DR. S. E. SWEITZER.

A woman, aged 23, presented four white irregular areas on the front and back of the chest. The condition had first appeared about two years previously. A biopsy specimen showed lichen sclerosus et atrophicus.

LICHEN PLANUS ACCUMINATUS. Presented by DR. H. E. MICHELSON.

A woman, aged 32, stated that she had a generalized eruption of eight months' duration and that in certain areas the eruption had disappeared only to recur again in other spots. Over the trunk there were typical flat-topped, angular, violaceous papules, while on the arms the lesions were follicular papules with firm horny plugs. The microscopic picture from these lesions showed a circumscribed infiltrate about the follicle with a cornified plug and an increase in the adjacent granular layer.

LICHEN RUBER PLANUS. Presented by DR. JOHN BUTLER.

A man, aged about 22, was presented because of a generalized eruption which consisted of minute polygonal papules, which were so numerous that the eruption

appeared almost like a sheet. Over the wrists it was noted that the papules were of a light color and appeared like small bullae. The roof of these bullae was very thick, and it was apparent that the lesions were the pemphigoid type of lichen planus.

DISCUSSION

ON FOUR PRECEDING CASES

DR. PAUL O'LEARY: I believe that the first case in this group was one of parapsoriasis rather than lichen planus, notwithstanding the histopathologic report. The absence of polygonal papules, pruritus, pigmentation and atrophy, and the lack of lesions of the mucous membrane and the location of the plaques were sufficient to eliminate lichen planus.

DR. HOWARD FOX, New York: I agree with Dr. O'Leary that from the appearance of the lesions, their duration and lack of itching the most probable diagnosis in the first case is parapsoriasis. Dr. Butler's case seemed to be one of the hypertrophic and somewhat verrucous type of lichen planus. Dr. Sweitzer's case, to my mind, was lichen planus atrophicus, the important differentiation being that it was not the guttata type of morphea. The scaling would rule this type out.

DR. S. E. SWEITZER, Minneapolis: Lichen sclerosus et atrophicus is placed in the chapter on lichen planus in the textbooks of Ormsby and Sutton. It is not a form of lichen planus and should not be placed there. For the present, lichen sclerosus et atrophicus, lichen albus of Zumbusch and chronic atrophic lichenoid dermatitis of Csillag should be placed in one group as an entity. White spot disease, morphea and the cardlike scleroderma of Unna should be placed in another group as varieties of scleroderma. The variety of lichen planus that ends in atrophy is real lichen planus and not lichen sclerosus et atrophicus.

DR. L. H. WINER, Minneapolis, by invitation: While I was in Vienna I had occasion to see a case of lichen sclereaux et atrophicus or lichen albus (Zumbusch) and to hear Professor Oppenheim discuss the case. The pathologic process of lichen sclereaux et atrophic (Hallopeau) was described by Darier in 1892 and is the same as that of lichen albus described by von Zumbusch in 1905. The pathologic process differs from that of lichen planus in that the latter shows a definite round cell infiltrate directly under the epidermis which is sharply bordered at its lower border, whereas, in lichen sclereaux or albus there is homogenization of the papillary cutis and the upper reticularis which is free of cells. However, around this homogenized cutis, there is a sort of mantel of round cell infiltrate. Due to the homogenization, histologically one is led to think more of a scleroderma, but the infiltrate around the homogenized mass sets it off so that the school in Vienna at present considers the condition in a group by itself between lichen planus and scleroderma.

DR. HAMILTON MONTGOMERY: The decision, whether or not lichen sclerosus et atrophicus, belongs with the atrophic diseases such as morphea and lichen albus; whether it is an aberrant form of lichen planus is not an easy problem to settle and has been the subject of a great deal of discussion, especially regarding the histopathology. The histopathologic picture apparently varies according to the stage of the disease at which the biopsy is taken. A systematic study and correlation of the clinical and pathologic observations of the various stages of the disease has not been made in a series of cases. Until this is done, I believe that the question of classification should be left open.

DR. H. E. MICHELSON, Minneapolis: Dr. Butler's case presents an excellent example of a case of lichen planus which has gone to bullous lesions. Microscopically, one finds bullae which may be very small, and are sometimes known as Joseph's spaces. I should like to examine a section from this person. I do not think that the lichen of Hallopeau is related definitely to lichen planus, but if one examines a great many sections of this condition, there are areas in which the infiltrate is dense and the zone of homogenization of the connective tissue between the infiltrate and the epidermis is narrow. I think that morphea and lichen

Hallopeau are different processes pathologically, and the end-result clinically is nearly the same.

In regard to the lichen planus accuminatus, or maybe it would be better to say lichen ruber accuminatus, Professor Arndt of Berlin used to discuss this condition frequently at meetings of the Berlin Dermatological Society, and I think that it is a definite localization in lichen planus. The microscopic picture in our case shows the characteristics of lichen planus with follicular arrangement.

DR. JOHN F. MADDEN, St. Paul: I think the differential diagnosis in cases of atrophic lichen planus, morphea and lichen atrophicus et sclerosus was well discussed by Dr. Ruben Nomland of Chicago in the ARCHIVES (**21**:573 [April] 1930). He gave a very clear microscopic differential diagnosis.

DR. S. E. SWEITZER: Dr. Butler and I saw Dr. Michelson's case of lichen planus a few months ago; at that time the lesions were red. We thought that it might be purpuric, and it looked more like Schamberg's at that time. Some months have elapsed, and the condition has changed to some extent.

SARCOID OF BOECK. Presented by DR. H. E. MICHELSON.

A woman, aged 29, whose personal and family history were negative for tuberculosis, stated that nodes had developed on the cheeks, forehead and the upper part of the arms insidiously and painlessly. At the time of presentation there were several deep-seated nodes on the cheeks, forehead and the upper portion of both arms; they were situated in and adherent to the skin. There was marked telangiectasia over the lesions. There was no softening or other surface change. Biopsy showed a deep-seated, lobular infiltrate made up of epitheloid cells with a few giant cells. The Pirquet and Wassermann reactions were negative.

ERYTHEMA INDURATUM. Presented by DR. JOHN BUTLER.

A woman, aged 25, was presented because of several deep-seated nodules in the hypoderm of the calves of the legs. The skin over the nodes was dark blue and showed scaling.

ERYTHEMA INDURATUM. Presented by DR. H. E. MICHELSON.

A woman, aged 23, stated that she had had an eruption on the legs about four years previously and that the circulation in the lower part of the legs had always been poor. As a child she had had enlarged cervical glands, and a diagnosis of pulmonary tuberculosis had been made. At the time of presentation the eruption consisted of a deep blue mottling of both legs with palpable nodules situated deep in the hypoderm. Biopsy showed little change in the epidermis, but a marked infiltrate in the subcutaneous fat causing an alteration of the fat spaces which were replaced with a tuberculoid structure. Elastic tissue stain showed that the infiltrate was centered about blood vessels, which had been completely occluded by the change in the endothelium and the circumcircular areas. The Pirquet reaction was strongly positive, resulting in a necrotic lesion. (A biopsy specimen was shown.)

GRANULOMA ANNULARE. Presented by DR. H. E. MICHELSON.

A girl, aged 16, presented an annular lesion on the left index finger. The lesion was about ½ inch (1.27 cm.) in diameter and had an ivory-white, raised border. The Wassermann and Pirquet reactions were negative. Biopsy showed a slight atrophy of the epidermis, a diffuse chronic type of infiltrate in the corium and areas of necrosis in the center of the infiltrate. The patient first reported on Aug. 31, 1929. On April 9 and on September 10, a few new rings appeared. There was no response to radium, but under intensive pressure ultraviolet radiation the lesion seemed to be undergoing a slow involution. (A biopsy specimen was shown.)

TUBERCULID EN PLAQUE. Presented by DR. S. E. SWEITZER.

The patient in this case was shown about four years previously and reported at that time.

SUBCUTANEOUS SARCOID. Presented by DR. H. E. MICHELSON.

The patient in this case was shown and reported on previously.

PAPULONECROTIC TUBERCULID WITH FAVUS OF THE SCALP. Presented by DR. S. E. SWEITZER.

A man, aged 49, born in Holland, presented numerous papules along both arms. These papules showed necrotic centers and healed with a pitted scar. The tuberculin, Pirquet and Moro tests all gave positive reactions.

The patient also presented atrophic scars on the scalp with areas of active favus, showing the yellow scutula. Fungus was demonstrated, and a culture shown. The condition on the scalp had been present for over forty years.

DISCUSSION

ON SEVEN PRECEDING CASES

DR. H. E. MICHELSON: This case of sarcoid of Boeck is a remarkable example of that condition. The Pirquet test has been repeatedly done and is always negative, which is consistent with Jadassohn's observations. On the other hand, the young woman with erythema induratum shows a marked reaction to tuberculin which results in a necrotic papule.

DR. L. A. BRUNSTING, Rochester: Most of the patients presented here, with one form of tuberculid or another, show evidence of circulatory disturbance of the extremities bordering on acrocyanosis. This was particularly true of the patients with erythema induratum, papulonecrotic tuberculid, tuberculid en plaque and also granuloma annulare. In each instance the hands and feet are mottled blue, moist and cold, giving a clammy sensation to the touch. I believe that this feature is a minor characteristic of the tuberculids, and is sometimes an aid in diagnosis.

DR. H. E. MICHELSON: It seems to me that one sees more and more cases of granuloma annulare. For my own part, I can see no connection between granuloma annulare and tuberculosis. True, there has been some converse argument in isolated cases, but in our own patients who have been observed for a number of years all of the examinations for tuberculosis have given negative results. Recently we have been doing a punch biopsy, not only for histologic purposes, but because, following the excision, healing frequently takes place. Maybe excision facilitates drainage rather than absorption. My results with roentgen treatment in granuloma annulare have not been good, while pressure treatment with a Kromayer lamp have given the best results.

DR. C. D. FREEMAN, St. Paul: In connection with granuloma annulare, I saw a case recently with Dr. Madden in which the condition receded rapidly under arsenic. In my opinion, tuberculosis and tuberculous lesions such as lupus vulgaris and verrucosus are not influenced by arsenic. This case was diagnosed both clinically and microscopically as granuloma annulare.

DR. HOWARD FOX: I am unable to give an opinion of value on the nature of granuloma annulare, though I doubt whether it should be classified as a tuberculid. I was struck by the entire failure of roentgen therapy in this case. In every case that I have followed the condition has yielded to this method of treatment.

Regarding sarcoid, I think that our conception of this disease should be broadened. Those of us who attended the Congress at Copenhagen will agree. We dermatologists are all familiar with the cases of reddish, smooth lumps, in which a diagnosis of sarcoid is often made by exclusion. Recently I saw a patient

at the University and Bellevue Clinic who presented only a few small erythematous patches on the arm, and I was astonished to find that it showed the histologic picture of sarcoid. I presented one patient with flat, annular lesions which proved to be sarcoid before the New York Dermatological Society, and I expect to present a similar case at the next meeting. In this case the annular lesions suggested a superficial basal cell epithelioma.

DR. PAUL O'LEARY: This is indeed a unique collection of tuberculids. The case presented by Dr. Sweitzer as a tuberculid en plaque is a most unusual clinical picture. The group emphasizes a variety of the clinical manifestations of tuberculosis, and the prominent part allergy plays in tuberculosis is evidenced by these clinical pictures. At the Congress at Copenhagen many patients with sarcoids were shown, in some of whom visceral disease, particularly in the bone and lungs, were demonstrable. It has been my practice for several years to search patients with sarcoid thoroughly for complications of the bony system as well as those in the lungs.

DR. S. E. SWEITZER: I have had an opportunity to see some of the early cases of sarcoid. In studying these cases, I was interested to note that sarcoid is a disease of rather protean manifestations as regards the skin. There is a type in which nodules with depressed centers form on the face, in this type the plaque form and the subcutaneous sarcoid are the same disease and are due to tuberculosis. However, it is striking to note the response of sarcoid to arsenic. These will often disappear under the administration of arsenic.

DR. H. E. MICHELSON: I am anxious to have Dr. Sweitzer report his case of tuberculosis en plaque. I think that it is probably closely related to erythema induratum, because when one observes erythema induratum over a long period one often sees annular lesions appearing on other parts of the body. I do not know what the Pirquet reaction is in Dr. Sweitzer's case, but this test should be very carefully done.

DR. L. A. BRUNSTING: Certain lesions about the wrists in the papulonecrotic tuberculid were like those in erythema multiforme. On account of the loss of weight and general debility, tuberculosis must be kept in mind, the lesion on the left arm representing the site of inoculation.

DR. H. G. IRVINE, Minneapolis: In speaking of the therapy in granuloma annulare, I want to offer one comment on a patient whom I saw a week or two ago. This patient first came in last spring with a characteristic lesion of the base of the thumb. Treatments with roentgen rays were suggested, but she thought that she could not afford them then. When I saw the patient again possibly six months had elapsed; there had been no treatment, and the condition had entirely disappeared.

DR. HOWARD FOX: I should like to say a few words about the treatment for papulonecrotic tuberculids. I have found that the course of some of the painful nodules on the hands could be greatly shortened by plunging a cautery point in the center of a fresh lesion. I have also recorded one excellent result obtained from the use of sulpharsphenamine in a case in which the condition was very extensive. After about thirty injections had been given, the eruption disappeared entirely, and at the end of six months only a slight recurrence had occurred.

EPHELIDES WITH ASSOCIATED VITILIGO AND CANITIES. Presented by DR. H. E. MICHELSON.

A girl, aged 17, stated that the color of her skin had been normal until she was 11 years old when her eyebrows and eyelashes turned white and sharply circumscribed, brown-pigmented, spots about the color of a freckle developed over the body, and the skin between the pigmented spots became very white. The pubic hair and some of the hair on the scalp became snow white. There had been no change during the past year. The family history was unimportant.

DR. H. E. MICHELSON: Dr. Finnerud showed a patient with a condition almost precisely like that in this girl before the Chicago Dermatological Society at the time that Professor Bloch was the guest of honor. He stated that he had seen a number of such cases and that he looked on them as a derangement of the pigmentary function, with a hypo-activity in certain areas with a hyperactivity in others.

PEMPHIGUS VULGARIS. Presented by DR. H. E. MICHELSON.

Mrs. E. S., aged 80, was seen at the University Dermatologic Clinic on Oct. 10, 1930, because of vesicles and bullae distributed over the body. The patient stated that the first symptoms of her ailment had appeared as blisters in the mouth and on the tongue in December, 1929; aside from that there was nothing in her history of importance. At the time of presentation there were numerous superficial flaccid bullae distributed over various parts of the body, in the mouth and in the vagina. The general health of the patient was excellent. In certain areas the bullae had disappeared leaving cystic scars. The bromine and iodine ointment tests gave negative results in all strengths. Nikolsky's sign was positive.

DISCUSSION

DR. HOWARD FOX: This case certainly looks like pemphigus, though it is most unusual in my experience to see this disease in such an elderly patient. I should like to inquire about loss of weight, which is such an important sign in this disease. I might add that in my experience the diagnosis test performed by Pels and Macht has thus far given encouraging results.

DR. JOHN F. MADDEN: There has been no recent loss in weight or change in her appearance. The patient has been in the hospital for only three days. A specimen of the blood has been sent in to Dr. Pels of Baltimore, but a report has not arrived as yet. As soon as we receive the report from Dr. Pels, I will be glad to forward it to Dr. Fox.

DR. H. E. MICHELSON: The patient presented is 80 pears of age, and my impression is that pemphigus occurring in persons of advanced years is much less malignant than in middle life. This particular patient is well except for the bullae. However, my observation has been that patients with pemphigus may have many bullae and still be rather well up to a certain point. Then the constitutional symptoms override the cutaneous symptoms, and frequently at the termination the cutaneous symptoms are negligible.

DR. PAUL O'LEARY: I also believe that as a rule in elderly persons pemphigus runs a protracted but a more benign course. In answer to Dr. Fox's question, approximately one half of our patients with pemphigus are Russian Jews, while the other half are native-born Americans of parents of various nationalities.

A CASE FOR DIAGNOSIS (THRUSH?). Presented by DR. H. E. MICHELSON.

A girl, aged 15, was presented because of lesions in the mouth, on the right hand and on the left side of the face. Physical examination gave essentially negative results except for the condition of the skin and nose. The lesions on the face consisted of plaques varying in shape from that of a pea to that of a dime with deep-seated vesicular borders and denuded, fissured centers. The lesions on the hand were deep-seated vesicles on a bright red inflammatory base, and previously involved areas exhibited fissure. The nails of the right index finger and thumb presented honey-combed fissured lesions with loosening of the nail. The tongue presented a slight microglossia, numerous fissures and a white fibrinous-appearing exudate which was adherent, but on removal did not leave a bleeding surface. Cultures from lesions of the mouth and finger were positive for fungi.

DISCUSSION

DR. H. E. MICHELSON: I am not sure of the diagnosis of the condition in this child. I think that the infection in the mouth, on the hands and of the nails is the same condition. Cultures positive for fungi have been obtained repeatedly, but they have not been identified. Therapeutic measures have been most disappointing.

DR. JOHN F. MADDEN: I am positive that this is a fungus infection, but I am not positive that the eruption is caused by *Oidium albicans*. Both the cultures and the fresh preparations are not typical of thrush. The lesions on the hand recur and seem to be reinfected from the nails. The lesions on the face involute under therapy, but as soon as they are healed new ones appear. I believe that they are transmitted from an infection of the mouth.

PIGMENTED PURPURIC LICHENOID DERMATITIS (GOUGEROT) OR GENERALIZED LICHEN NITIDUS. Presented by DR. H. E. MICHELSON.

A man, aged 46, whose family and personal history were of no importance, stated that his cutaneous manifestations had begun several months previously with a redness of the face, scaling of the scalp and a pinpoint, red eruption distributed over the lower part of the trunk and legs. Examination of the head showed what was apparently an acute seborrheic dermatitis, while the lower part of the trunk and the legs were covered with an eruption which on analysis showed many small papules about 1 mm. in diameter. There were slight areas of brilliant red that resembled lesions of lichen planus. Microscopic section showed atrophy of the epidermis, a sharply demarcated infiltrate in the papillary portion of the cutis that was made up of round cells, a few fibroblasts and many free red blood corpuscles with an occasional capillary. There was also pigment present in spots. The case resembled very closely those discussed by Gougerot and Blum (*Arch. Dermat.-Syphil. de l'hôp. St. Louis* **1**:555 [Sept.] 1929). (A biopsy specimen was shown.)

Histologic sections were submitted to Dr. Geiger of Vienna who thought that the microscopic picture was that of lichen nitidus with free blood corpuscles.

DISCUSSION

DR. H. E. MICHELSON: This condition was described by Gougerot and Blum and is closely related to Schamberg's pigmented dermatosis, but differs from it in that it is generalized and is composed of definite lichenoid lesions which microscopically resemble lichen planus and lichen nitidus, except that in the infiltrate there are many free red blood corpuscles that are evidently the result of the inflammation.

I have been glad to have the privilege of observing and presenting this patient, and some one in our clinic will make an extensive report later.

CARCINOMA IN CERVICAL REGION. Presented by DR. H. E. MICHELSON.

A man, aged 53, presented a swelling in the right suboricular region about the size of a lemon. In the center of the mass there were three small fistulous openings that discharged a thin serous pus. The case had been diagnosed as actinomycosis, and two superficial biopsies had been reported as nonmalignant. The section presented was taken with a punch from the depth of the lesion and showed squamous celled carcinoma, probably of epidermal rest origin. The therapy was radium implantations.

A CASE FOR DIAGNOSIS (ACTINOMYCOSIS? SYPHILIS?). Presented by DR. H. E. MICHELSON.

The patient came to the University Dermatologic Clinic because of a small nodular mass in the submental region. He stated that in May he had had nine teeth removed from the mandible; following this an abscess, also submental, and

sinuses that connected with the oral cavity had developed. The past history revealed that he had been treated for syphilis three years previously and that at the time of presentation the right tibia and fibula showed marked lateral thickening throughout their length. The Wassermann reaction of the blood was negative, and smears and cultures from the submental ulceration were repeatedly negative for actinomyces or fungi. The roentgenographic diagnosis of the tibia and fibula was syphilitic periostitis. A biopsy specimen was indicative of actinomycosis.

MAL DEL PINTO. Presented by DR. HOWARD FOX.

Dr. Fox discussed this disease from cases he had studied in Mexico. Slides showed its apparent identity with caraate.

SAN FRANCISCO DERMATOLOGICAL SOCIETY

THOMAS CLARKE, M.D., *Chairman*

Oct. 30, 1930

H. J. TEMPLETON, M.D., *Secretary*

URTICARIA PIGMENTOSA. Presented by DR. C. J. LUNSFORD.

Mrs. M. K., aged 70, was first seen in August, 1930. She complained of "small hives" around her waist and abdomen. These were first noted in May, 1930. There had been only an occasional mild pruritus. No illness or infection preceded the onset of the condition. She had taken bromides for about one year prior to the onset but none during the last month. Her mouth was edentulous, and her tonsils appeared normal.

Around the waist and on the abdomen, thighs and back there were small brown maculopapules. When rubbed they became slightly redder and occasionally slightly urticarial. Histopathologic observations were those of an extremely dense infiltrate of large cells in the subpapillary region, rather sharply defined from the reticular layer. When stained with Unna's polychrome methylene blue these were seen to be mast cells. One unusual feature was the extremely dense character of this mast cell infiltrate. The section was taken from an area that had previously been rubbed.

DISCUSSION

DR. H. MORROW: In similar cases we have treated the patients with roentgen rays, but they have failed to show improvement.

DR. G. D. CULVER: Treatment of this patient would have to be almost entirely symptomatic. It is unlikely that any specific change could be accomplished.

LEPROSY. Presented by DR. NORMAN EPSTEIN.

F. D., a Mexican woman, aged 20, presented a macular erythematous eruption on her face, arms and legs, with no induration. The lesions were more violaceous at some times than at others, particularly those on the legs. There were definite changes in sensation over these lesions. The left ulnar nerve was somewhat thickened. The condition had been present for eight months. The patient had been a resident of California for three years.

LEPROSY. Presented by DR. C. J. LUNSFORD.

B. W., a Chinese boy, aged 16 years, was born in San Francisco. He went to China at the age of 8 because of asthma, but without benefit. He returned to the United States in January, 1930. He stated that he had an eruption on

the left knee-cap eighteen months before, which disappeared without treatment. About April, 1930, a different type of eruption appeared over the same knee-cap and spread gradually. The entire left knee was included in a patch of anesthetic skin, the periphery of which was red, raised and scaling. It was well circumscribed. Palpation revealed induration about the border. The center of the lesion had the appearance of normal skin. Tests for sensation showed anesthesia in this area. There were no subjective symptoms.

The skin was excoriated on several occasions, and slides taken of the lymph for examination for Hansen's bacillus, but in no case was it found. A biopsy was taken without local anesthesia. The operation was painless. The results of a complete physical examination including a Wassermann test of the blood were negative, except for the condition mentioned.

DISCUSSION

DR. H. MORROW: One would not expect to find bacilli in such a case as Dr. Lunsford presented. It is clinically leprosy just as is the patch on the forehead of the patient presented by Dr. Epstein.

DR. C. SCHOFF: Vesiculation of a lesion and examination of the vesicle fluid might enable one to demonstrate the bacilli.

DR. C. J. LUNSFORD: The advancing edges should show bacilli.

DR. H. MORROW: We have hunted for the bacilli in many cases of this kind, and have nearly always failed to find them.

DR. T. CLARKE: We rounded up four lepers in Oakland Chinatown in one investigation.

DR. C. SCHOFF: I remember a case of leprosy in a Caucasian born in the state of Maine of a lineage which was traced in the United States for two generations. He worked in the delta region of Sacramento county as a farmer and packing house foreman and also had land there. He was sent to me for diagnosis by his attorney because a layman's diagnosis of leprosy had been made. The patient had Hansen bacilli in the nasal secretions and in the serum from a nodule of the ear. Believing that spiritual devotion would produce a cure, he did not permit observation other than that required by law. He died several months later.

DR. N. EPSTEIN: This patient has been under observation for about six weeks. Examination of microscopic sections of the tissue failed to show acid-fast bacilli. Nasal smears were also negative. The lesions were more indurated than on the original examination.

SOLAR DERMATITIS. Presented by DR. H. J. TEMPLETON.

O., a girl, aged 19, was first seen in October, 1929. At that time she presented an erythematous dermatitis of the exposed V-portion of her neck, on the dorsum of the hands and on the arms and face. The eruption had first appeared one year previously. Her general health was excellent. There was no history of illness prior to the onset of the eruption. No drug except SSS had been ingested. Blood counts, a urinalysis and a "blood test" were said to have given normal results at the time of onset. She had severe seborrhea of the scalp. The condition was regarded as a light dermatitis and the patient was warned to keep out of sunshine. She was not seen again until September, 1930, at which time she presented the same type of dermatitis. On the face the condition appeared on the exposed surfaces only, stopping abruptly where the hair was draped over the cheeks and forehead. Similar sharp margination was noted in the V of the neck. Her skin was tested for sensitivity to ultraviolet light and roentgen rays, but none was demonstrated. This does not eliminate the possibility of solar dermatitis, for Urbach has demonstrated sensitivity to other wave length bands of the spectrum. Hematoporphyrin was demonstrated in the urine both chemically and spectroscopically.

DISCUSSION

DR. T. CLARK: I observed this patient for three years. There was considerable seborrheic dermatitis. I advised the wearing of a scarf. The skin freckled and sunburned easily. Application of resorcin ointment externally and administration of iron helped her.

DR. L. TAUSSIG: I would suggest that the condition is lupus erythematosus and would recommend gold compounds.

SOLAR DERMATITIS. Presented by DR. H. J. TEMPLETON.

M., aged 3 years, was first presented before the society last winter. She had had several attacks of dermatitis of the exposed portions of the body, each one of which followed exposure to sunshine. After the acute phase of the solar dermatitis subsided, a coarse reticulation of the skin remained. A particularly severe attack occurred last summer following a deliberate exposure to sunshine by a member of her family who thought that sunshine would be good for her. During the spring marked photophobia developed, and the child could not be taken into bright sunshine. Two ophthalmologists reported a possible sensitivity of the retina, which, like the skin, is of ectodermal origin. There is no history of similar trouble in her family. Her mother's Wassermann reaction was negative. Hematoporphyrin was observed in the urine both chemically and spectroscopically.

DISCUSSION

DR. G. D. CULVER: Are there any albinos in the family? The child's skin might be protected to some extent by the wearing of a full covering of red or yellow.

DR. H. MORROW: I would suggest that she be permitted to sleep during the sunny part of the day.

DR. C. SCHOFF: Desensitization to light by the application of homeopathic doses might be tried.

ERYTHEMA INDURATUM. Presented by DR. NORMAN EPSTEIN.

A. P., a woman, aged 21, presented an eruption limited to the lower third of each leg, mainly posteriorly but extending on to the sides of the leg. It was composed of a number of bluish, nontender, cutaneous and subcutaneous nodules, which had been present for seven months. Examination revealed an old healed Koch infection of the apex of the right lung. A tuberculin test was negative for human, but positive for bovine, tuberculosis. Treatment consisted of exposures of the entire body to ultraviolet light; this had been continued for four months before presentation. For three months she had been receiving tuberculin therapy twice weekly, old tuberculin being used. The initial dose was 0.1 cc. of a 1:10,000 solution. At the time of presentation she was receiving 0.7 cc. of a 1:1,000 solution. There had been considerable improvement.

DISCUSSION

DR. C. SCHOFF: Is gold sodium thiosulphate of value in these cases or is it apt to cause a deleterious effect? I recall a patient, now under treatment, who had an old pulmonary tuberculosis apparently arrested for years; after seven injections of gold sodium thiosulphate, pulmonary signs consisting of moisture and an increase in cough and sputum appeared. I question the advisability of considering the disease purely as a local condition; more attention should be directed to the general condition.

DR. H. MORROW: Bazin's disease can probably be classified as an actual tuberculosis of the skin rather than as a tuberculid.

DR. N. EPSTEIN: In our experience, gold and sodium thiosulphate has been rather disappointing in cases of this kind. However, an occasional benefit is

obtained. The use of tuberculin seems rational in erythema induratum, particularly when the cutaneous lesions are the only active processes found.

A Case for Diagnosis. Presented by Dr. H. J. Templeton.

R., a man, aged 27, was first seen in September, 1930. For several months he had noted the present eruption on his back. Below the right scapula there was a hard nodule about 1 cm. in diameter, elevated 0.5 cm. above the skin. This nodule had the appearance of a fibroma. There was a circle of small slightly indurated papules arranged in a circular manner around the central papule and about 2 cm. away from it. The picture was roughly suggestive of a corymbiform syphilid. On the posterior aspect of the left arm there was an arciform arrangement of papules similar to the satellite ones mentioned. There was no pain or itching. Histopathologic examination showed a dense perivascular infiltrate in the corium consisting of small, round cells. Plasma cells were practically absent. The Kolmer, Wassermann, Kahn and Müller balloon reactions were negative. An intradermal organic luetin test was negative.

DISCUSSION

Dr. H. Morrow: After examining the patient and the section I would suggest a therapeutic test for syphilis.

Dr. C. Schoff: A blood count should be done in order to rule out leukemia. (This was done and was found to be normal.)

Dr. H. Alderson: I am sorry that I arrived too late to see the patient, but the sections are interesting. The perivascular infiltrate is too dense for syphilis, and there are no plasma cells. I should like to look over some serial sections.

Book Reviews

HYPERSENSIBILITÉS SPÉCIFIQUES DANS LES AFFECTIONS CUTANÉES-ANAPHYLAXIE-IDIOSYNCRASIE. By PASTEUR VALLERY-RADOT, Professeur agrégé à la Faculté de Médecine de Paris, Médecin des Hôpitaux and MLLE. V. HEIMAN, Interne des Hôpitaux de Paris. Paper. Price, 25 francs. Pp. 146. Paris: Masson & Cie, 1930.

After a careful consideration of the experimental and clinical facts comes a recapitulation of the methods for recognizing hypersensibility in a given cutaneous disease. Next comes a discussion of such dermatoses as urticaria, artificial dermatoses, eczema, pruritus, the prurigos and strophulus plus recurrent herpes and herpetiform dermatitis. The last chapter is devoted to a review of the therapeutic methods employed in such cases. The authors agree with the American and German writers who do not attempt to discriminate between anaphylaxis and idiosyncrasy. What they term allergic disorders the authors have named "maladies by hypersensibility." They do not consider eosinophilia as a stigma of anaphylaxis or as a sign of colloidoclasic diathesis. In a majority of their cases of eczema they have been unable to show a sensibility to a protein. It is erroneous, they believe, to consider a simple local erythema as a positive cutireaction. Of the therapeutic measures, the following are recommended: polyvalent peptone before meals, autoserotherapy, autohemotherapy, calcium chloride by mouth or intravenously, and sodium thiosulphate by the intravenous route, as suggested by Ravaut. It is pleasing to note not a few references to the writings of American workers. This monograph by one of Fernand Widal's outstanding pupils can be unreservedly recommended as a practical contribution to our knowledge of this as yet largely unexplored field.

LA PRATIQUE MÉDICALE ILLUSTRÉE. LES TRAITEMENTS MODERNES DE LA PARALYSIE GÉNÉRALE. By A. SÉZARY, Professeur agrégé à la Faculté de Médecine de Paris, Médecin de l'Hôpital Saint-Louis, and A. BARBE, Médecin Aliéniste des Hôpitaux de Paris. Paper. Price, 8 francs. Pp. 35. Paris: Gaston Doin, 1930.

This monograph is devoted largely to the use of stovarsol or acid-acetyl-oxy-amino-phenyl-arsinic in dementia paralytica. This drug was introduced by Louis Fournier and Levaditi. It is given by mouth or subcutaneously. The authors have employed the skin route, the dose being 1 Gm., given three times weekly, for a total of twenty-one treatments. Their conclusions are as follows: "After a study of our statistics, it would seem that in its present form, the stovarsol treatment for dementia paralytica is a simple method, without danger, which ameliorates the condition of these patients in the proportion varying from 68, 58 or 26 per cent, depending on whether one is dealing with the form with excitation, dementia paralytica plus diminished intellect or the type with complete dementia. This drug rarely restores the cerebrospinal fluid to normal." The authors compare their method with the malarial treatment in the following words, "Therefore, if we may judge from our statistics, the treatment for dementia paralytica by means of stovarsol seems to us, by its action on the clinical state and on the humoral anomalies, easily to hold itself up to comparison with the malarial treatment. By its lack of danger, by its more extensive indications and by the ease of its employment, it is certainly superior to the Austrian method." As a concise and practical contribution to the treatment for dementia paralytica, this booklet is worthy of hearty recommendation.

Directory of Dermatologic Societies *

NATIONAL DERMATOLOGIC SOCIETIES

American Medical Association, Scientific Assembly, Section on Dermatology and Syphilology

Elmore B. Tauber, Chairman, 19 W. 7th St., Cincinnati.
Francis E. Senear, Secretary, 55 E Washington St., Chicago.
Place: Philadelphia. Time: June 8-12, 1931.

American Dermatological Association

C. Morton Smith, President, 437 Marlboro St., Boston.
W. H. Guy, Secretary, 500 Penn Ave., Pittsburgh.
Place: Toronto. Time: June 15-17, 1931.

British Association of Dermatology and Syphilology (Canadian Branch)

Emerson J. Trow, President, Medical Arts Bldg., Toronto.
Hamnett A. Dixon, Secretary, Medical Arts Bldg., Toronto.

SECTIONAL DERMATOLOGIC SOCIETIES

Baltimore and Washington Dermatological Society

Isaac R. Pels, President, 1010 St. Paul St., Baltimore.
H. Hanford Hopkins, Secretary, Johns Hopkins Hospital, Baltimore.

Iowa and Western Illinois Dermatological Association

J. C. Kessler, President, University Hospital, Iowa City.
J. W. Bailey, Secretary, 10th St. and Grand Ave., Des Moines, Iowa.

New England Dermatological Society

Walter T. Garfield, President, 19 Bay State Rd., Boston.
Rudolph Jacoby, Secretary, 270 Commonwealth Ave., Boston.

Southern Medical Association, Section on Dermatology

Chairman: Clifton Brooks Willmott, 608 S. 4th Ave., Louisville, Ky.
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STATE DERMATOLOGIC SOCIETIES

Louisiana Dermatological Society

Thomas A. Maxwell, President, 1119 Union Indemnity Bldg., New Orleans.
R. A. Oriol, Secretary-Treasurer, Maison Blanche Bldg., New Orleans.

Medical Society of the State of New York, Section on Dermatology and Syphilology

Earl D. Osborne, Chairman, 471 Delaware Ave., Buffalo.
Leo Spiegel, Secretary, 241 W. 100th St., New York.

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* Secretaries of dermatologic societies are requested to furnish the information necessary for the editor to make this list complete and to keep it up to date.

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SECTION ON DERMATOLOGY

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E. A. Oliver, Secretary, 55 E. Washington St., Chicago.

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